

New Regular Feature: "Tracking the Trunks"

Vol. 16, No. 8

August 1997

U.S. \$3.95

Can. \$6.25

Printed in the United States

Monitoring Times®

Your Personal
Communications Source

- Send Your Receiver to DX Camp
- Rebuild the "Ocean Hopper"
- Reviews:

Drake SW-2 Receiver

Uniden PRO-64 Scanner



Radio Netherlands Hits the Big "5-0"



iCan

Reaction Tune Another Receiver!

Reaction Tune the
NEW
ICOM IC-R10

Use the OptoLinX
for computer controlling
the ICOM IC-R10
\$129.00



Computer Not Included

Scout's unique functions. Whether you're searching for new frequencies in your neighborhood, or testing for interference, the *Scout* is the ultimate communications tool.

Armed with a 400 frequency memory register, the *Scout* does not record duplicate frequencies, instead it coordinates repeated frequencies into a hit register storing up to 255 hits per frequency. Attach it to your belt and begin your day, the *Scout* will alert you when a signal is received by its beeper or vibrator function.

You won't miss a thing with Reaction Tune. The *Scout's* CI-V compatible output allows it to interface to the AOR AR2700/AR8000, ICOM R7000, R7100, R8500, R9000 and now the new IC-R10 (shown opposite). The *Scout* captures the frequency, then sends the serial data to the receiver and tunes the scanner to the frequency for instant monitoring in less than one second. Recorded frequencies can be downloaded to a PC using the optional OptoLinX universal interface •

SPECIFICATIONS

- ▶ 10MHz - 1.4GHz frequency coverage
- ▶ Stores and records 400 frequencies in memory with 255 hits for each
- ▶ Interface to a PC for frequency download using optional OptoLinX PC interface
- ▶ Distinctive beeps indicate frequency hits, pager style vibrator for discreet recording
- ▶ Automatic EL backlight for night operation
- ▶ 16 segment RF signal strength bargraph
- ▶ Frequencies are automatically saved when unit is turned off
- ▶ Reaction Tune the ICOM R7000, R7100, R8500, R9000, IC-R10, and AOR AR2700, AR8000, and the Radio Shack Pro 2005/6 using the Optoelectronics OS456, Radio Shack Pro 2035/42 using the Optoelectronics OS535

U.S. Patent No. 5,471,408



Scout with ICOM IC-R10
Mono Cable required (shown)

Radio Not Included

FACTORY DIRECT ORDER LINE 800•327•5912



OPTOELECTRONICS®

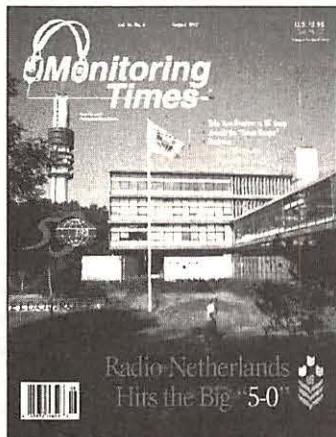
INNOVATIVE PRODUCTS FOR A MODERN PLANET

5821 NE 14th Avenue • Ft. Lauderdale, FL • 33334

Telephone • (954) 771•2050 Fax • (954) 771•2052

Visa, Mastercard, C.O.D. Prices and specifications are subject to change without notice or obligation

The ICOM logo is a registered trademark of ICOM Inc. ICOM IC-R10 not distributed by OPTOELECTRONICS, contact ICOM for information and availability.



Cover Story

Radio Netherlands Hits the Big "5-0"

By Jeffrey Poulin

Fifty years ago, in the aftermath of World War II, a radio service with a distinctly Dutch voice came on the air. The station recognized that a country half the size of South Carolina can't demand the world's attention, so Radio Netherlands set about winning the loyalty of its listeners by interesting and useful programming, the best in reproduction techniques, and a readiness to change with the times.

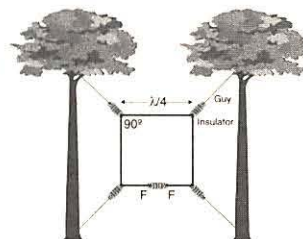
The formula has worked well for fifty years for this "European station with the Dutch accent." The story starts on page 8.

CONTENTS

Send Your Receiver to Camp 12

By Philip Gebhardt

... DX camp, that is, where the reception of distant signals takes precedence over eating and sleeping. Gebhardt gives examples of camps that vary from one to dozens of people, and antennas strung as Vs, Ts, Ls, squares, diamonds, and triangles. What will *your* receiver say when asked, "What did you do this summer...?"



The Under \$30 Antenna Launch 20

By Chuck DeLongfield



A slingshot, fishing reel, and a tree are all the ingredients you need to erect a great antenna, whether at home or in the field.

DMAT's Mobile Medical Teams 21

By Patrick Griffith

When a natural or man-made disaster requires medical care and evacuation, a number of federal agencies are equipped to respond. One such organization is the Disaster Medical Assistance Team. Here are some monitoring tips from CO-2's communications officer.

Upgrading the Ocean Hopper 22

By Al Cikas

Many readers will remember the Knight kits, especially the Ocean Hopper shortwave receiver. If you never had a chance to make one, you can build your own without the kit. This slightly revised circuit reduces the danger of electrical shock that was inherent in the original design.

Reviews:

Magne tests the SW2 shortwave receiver, and says Drake has nearly achieved the goal of producing a worthy performer for less than \$500 (page 92). The Radio Shack PRO-64 mobile scanner comes under Parnass' eye. He pronounces it a major improvement over the PRO-62 (page 94). Catalano checks out a communication mode decoding program, **Radioraft**, that works very well — and the lite version is free! (p.85)





MONITORING TIMES
(ISSN: 0889-5341) is
published monthly by
Grove Enterprises, Inc.,
Brasstown, North
Carolina, USA.

Copyright © 1997. Periodicals postage paid
at Brasstown, NC, and additional mailing
offices. Short excerpts may be reprinted
with appropriate credit. Complete articles
may not be reproduced without permission.

Address: P.O. Box 98, 7540
Highway 64 West,
Brasstown, NC 28902-
0098
Telephone: (704) 837-9200
Fax: (704) 837-2216 (24 hours)
Internet Address: www.grove.net (web) or
mt@grove.net (e-mail)
Editorial e-mail: mteditor@grove.net
Subscriptions: order@grove.net

Subscription Rates: \$23.95 in US; \$36.50
Canada; and \$55.45 foreign elsewhere, US
funds. Label indicates last issue of subscrip-
tion. **See page 103 for subscription information.**

Postmaster:
Send address changes to *Monitoring Times*,
P.O. Box 98, Brasstown, NC 28902-0098.

Disclaimer:
While *Monitoring Times* makes an effort to
ensure the information it publishes is accu-
rate, it cannot be held liable for the contents.
The reader assumes any risk for performing
modification or construction projects pub-
lished in *Monitoring Times*. Opinion or
conclusions expressed are not necessarily
the view of *Monitoring Times* or Grove
Enterprises. Unsolicited manuscripts are
accepted. SASE if material is to be returned.

Owners

Bob and Judy Grove

Publisher

Bob Grove, WA4PYQ
bgrove@grove.net

Managing Editor

Rachel Baughn, KE4OPD
mteditor@grove.net

Assistant Editor

Larry Van Horn, N5FPW

Art Director

John Bailey

Design Assistant

Belinda McDonald

Advertising Svcs.

Beth Leinbach
(704) 389-4007
beth@grove.net

Business Manager

Kelly Davis, KE4TAM
kelly@grove.net

DEPARTMENTS

Letters	4	Plane Talk	76
Communications	6	<i>Separation Anxiety</i>	
PCS Front Line	28	Federal File	78
<i>Pick a Pock of Packets</i>		<i>Brave New World of Scanning</i>	
Scanning Report	30	Satellite TV	80
<i>The TrunkTracker Debuts</i>		<i>The Big Dish Advantage</i>	
Utility World	34	Experimenters Workshop	82
<i>HF Maritime Station News</i>		<i>WINRADIO's Spectrum Scope</i>	
Global Forum	38	Computers & Radio	84
<i>SW Mirrors the World</i>		<i>Radiocraft Decoding Program</i>	
QSL Report	42	Programming Spotlight	86
English Lang SW Guide	43	<i>Culture and the Arts</i>	
Propagation Conditions	63	Tracking the Trunks	88
<i>Near Vertical Incidence Skywave</i>		<i>Getting on Track</i>	
Beginner's Corner	64	What's New	89
<i>Are you suffering from LMS?</i>		Magne Tests	92
Below 500 kHz	66	<i>Drake SW-2</i>	
<i>Lowfer ZWI</i>		Scanning Equipment	94
American Bandscan	68	<i>Radio Shack PRO-64</i>	
<i>Domestic DX and the Internet</i>		Antenna Topics	96
Outer Limits	70	<i>Using a Counterpoise to Aim High</i>	
<i>Pirate Loggings Explosion!</i>		Special Events/Club Circuit	98
On the Ham Bands	72	Ask Bob	100
<i>World of Ham Radio CD</i>		<i>MW BC Overload Cure</i>	
DeMaw's Workbench	74	Stock Exchange	102
<i>Homebrewed Breadboards</i>		Closing Comments	104
		<i>What's the big secret?</i>	

EDITORIAL STAFF

Correspondence to columnists may be mailed c/o *Monitoring Times*; any request for a reply should include an SASE.

Frequency Manager	Gayle Van Horn	gayle@grove.net
Frequency Monitors	David Datko, Mark J. Fine	
Program Manager	Jim Frimmel	frimmel@startnet
American Bandscan	Doug Smith, W9WI	72777.3143@compuserve.com
Antenna Topics	W. Clem Small, KR6A	clemsmall@bitterroot.net
Beginner's Corner	T.J. Arey, WB2GHA	tjarey@mosquito.com
Below 500 kHz	Kevin Carey, WB2QMY	KCarey@mdsroc.com
Communications	Larry Miller	NSCAN@aol.com
Computers and Radio	John Catalano	j_catalano@conknet.com
DeMaw's Workbench	Doug DeMaw, W1FB	
Digital Digest	Bob Evans	revans@astral.magic.ca
Experimenters' Wkshp	Bill Cheek	bcheek@san.rr.com
Federal File	John Fulford, WA4VPY	johnf@emi.net
K.I.S. Radio	Richard Arland, K7SZ	k7sz@juno.net
Magne Tests	Lawrence Magne	
On the Ham Bands	Ike Kerschner, N3IK	
Outer Limits	George Zeller	George.Zeller@acclink.com
PCS Front Line	Dan Veeneman	dan@decode.com
Plane Talk	Jean Baker, KIN9DD	
Propagation	Jacques d'Avignon	monitor@rac.ca
QSL Corner	Gayle Van Horn	gayle@grove.net
Satellite TV	Ken Reitz, KS4ZR	ks4zr@compuserve.com
Scanning Equipment	Bob Parnass, AJ9S	
Scanning Report	Richard Barnett	ScanMaster@aol.com
SW Broadcasting	Glenn Hauser	ghauser@hotmail.com
SW Broadcast Logs	Gayle Van Horn	gayle@grove.net
Tracking the Trunks	Larry Van Horn, N5FPW	trunktracker@grove.net
Utility World	Larry Van Horn, N5FPW	steditor@grove.net
What's New?	Larry Miller	NSCAN@aol.com

GroveNet hosts the following managed lists free of charge to the hobby.

acars ACARS mailing list
amfmtdvx AM/FM/TV DX mailing list
code30users Hoka Code 30 demodulator users
code3list Hoka Code 3 and Code 3 Gold decoder users
fedcom Federal communications
hearsat-l HearSat-l Mailing List
milcom Military HF/VHF/UHF communications monitoring
scan-dc Scanner radio topics in Washington, DC - Baltimore
trunkcom For discussion about the new TrunkTracker scanners
wun Worldwide UTE News Club List (Nonbroadcast SW Radio)

Example:

To subscribe to acars, send E-mail to majordomo@grove.net, with "subscribe acars" in body (no signature). Add "-digest" to subscribe to digest (a block of 100 messages).

Bearcat Intercepts Trunked Radio

COMMUNICATIONS ELECTRONICS INC.

New...Bearcat Trunktracking radio

For over 28 years, thousands of radio operators have depended on scanners, digital voice loggers, CB, GMRS transceivers, weather forecasting equipment and more from Communications Electronics. To get your free fax-on-demand catalog, call 313-663-8888 from the telephone handset on your fax machine and follow the recorded voice prompts.

Bearcat® 3000XLT-A Radio Scanner

Mfg. suggested list price \$699.95/Special \$329.95

FREE - Get an extra BP2500 battery pack, a \$41.95 value when you order a Bearcat 3000XLT. Hurry...offer expires 8/30/97.

400 Channels • 20 banks • Twin Turbo Search/Scan
Frequency Transfer • VFO Control • Automatic Store
10 Priority Channels • Selectable Mode • Data Skip
Frequency step resolution 5, 12.5 & 25 KHz.

Size: 2-3/4" Wide x 1-1/2" Deep x 7-3/8" High
Frequency Coverage:
25,000-549,995 MHz., 760,000-823,995 MHz., 849.0125-868,995 MHz., 894.0125-1,300,000 MHz.

The Bearcat 3000XLT is the ideal handheld radio scanner for communications professionals. This handheld scanner scans at 100 channels per second and searches at a rate up to 300 steps per second. A selectable attenuator eliminates annoying intermodulation from adjacent frequencies in highly populated areas.

Selectable AM, Wide FM and Narrow FM modes allow you to change the default receiving mode of the BC3000XLT. For maximum scanning pleasure, order the following optional accessories: UA502 Cigarette lighter power cord for temporary operation from your vehicle's cigarette lighter \$14.95; LC3000 Deluxe swivel leather carrying case \$34.95; BP2500 rechargeable nickel-cadmium battery pack for up to five hours of dependable use \$29.95; ANTMBCNC Magnetic mount scanner antenna with BNC jack and 12 feet of cable \$29.95. ANTSGBNC Glass mount scanner antenna with BNC cable \$29.95. The BC3000XLT comes with AC adapter, belt clip, flexible rubber antenna, earphone, owner's manual and one year limited Uniden warranty. Order today.

Bearcat® 9000XLT-A Radio Scanner

Mfg. suggested list price \$769.95/Special \$344.95

500 Channels • 20 banks • Alpha numeric display

Size: 10-1/2" Wide x 7-1/2" Deep x 3-3/8" High

Frequency Coverage: 25,000-549,995 MHz., 760,000-823,995 MHz., 849.0125-868,995 MHz., 894.0125-1,300,000 MHz.

The Bearcat 9000XLT is superb for intercepting communications transmissions with features like TurboSearch™ to search VHF channels at 300 steps per second. This base and mobile scanner is also ideal for intelligence professionals because it has a selectable attenuator to help eliminate annoying intermodulation from adjacent frequencies in highly populated areas and selectable AM, Wide FM and Narrow FM modes that allow you to change the default receiving mode of the BC9000XLT. Other features include Auto Store - Automatically stores all active frequencies within the specified bank(s). Auto Recording - This feature lets you record channel activity from the scanner onto a tape recorder. Hi-Cut filter to help eliminate unwanted static noise. You can even get an optional CTCSS Tone Board (Continuous Tone Control Squelch System) which allows the squelch to be broken during scanning only when a correct CTCSS tone is received. For maximum scanning enjoyment, order the following optional accessories: PS001 Cigarette lighter power cord for temporary operation from your vehicle's cigarette lighter \$14.95; PS002 DC power cord - enables permanent operation from your vehicle's fuse box \$14.95; MB001 Mobile mounting bracket \$14.95; BC005 CTCSS Tone Board \$54.95; EX711 External speaker with mounting bracket & 10 feet of cable with plug attached \$19.95. The BC9000XLT comes with AC adapter, telescopic antenna, owner's manual and one year limited Uniden warranty.

TrunkTracking

Bearcat® 235XLT-A TrunkTracker

Mfg. suggested list price \$429.95/CEI price \$269.95

300 Channels • 10 banks • Trunk Scan and Scan Lists
Trunk Lockout • Trunk Delay • Extra battery & charger
10 Priority Channels • Programmed Service Search
Size: 2-1/2" Wide x 1-3/4" Deep x 6" High

Frequency Coverage:
29,000-54,000 MHz., 108-174 MHz., 406-512 MHz., 806-823,995 MHz., 849.0125-868,995 MHz., 894.0125-956,000 MHz.

The Bearcat TrunkTracker BC235XLT, is the world's first scanner capable of tracking a selected radio transmission as it moves across a trunked radio system. Now it's easy to monitor fleets and subfleets in analog trunked radio systems. The BC235XLT can also work as a conventional scanner. This 300-channel, programmable handheld scanner provides scanner users with uninterrupted monitoring capabilities of Type I, II, III and hybrid trunking systems. One of the biggest obstacles in the scanner industry has been the increasing use of trunking radio systems in business and public agencies throughout the United States and Canada. This makes it nearly impossible to track a conversation moves within a trunk system from frequency to frequency. According to Ken Ascher, WB8LIT, Chairman & CEO of Communications Electronics, "The Bearcat 235XLT is a revolutionary breakthrough in scanner technology. Now it's easy to continuously monitor conversations even though the message is switching frequencies." The BC235XLT comes with AC adapter, CRX120 battery charger, two rechargeable long life nickel cad battery packs, belt clip, flexible rubber antenna, earphone, owner's manual and one year limited Uniden warranty. Not compatible with AGEIS, ASTRO, EDACS, ESAS and LTR systems. Call 1-800-USA-SCAN to order your scanner now.



Save up to \$950.00

It pays to be a *Monitoring Times* reader. Order any scanner or transceiver from CEI. Send or fax this coupon with copy of the bar code from the front cover and save.

VR204DAT8 8 channel digital audio logger	Save \$750.00
HS100 RELM 100 channel handheld scanner	Save \$15.00
BC9000XLT Bearcat 500 channel alphanumeric scanner	Save \$20.00
29LTD Cobra CB with sound tracker technology	Save \$15.00
LCWHS RELM swivel deluxe leather carrying case	Save \$20.00
BCWHS RELM rapid charge ni-cad battery charger	Save \$10.00
SWMP RELM speaker/mic for WHS or MP radio	Save \$10.00
BC007 RELM extra ni-cad battery pack	Save \$10.00
BC002 Bearcat CTCSS tone board	Save \$20.00
BC003 Bearcat switch assembly for BC002	Save \$10.00
BC005 Bearcat CTCSS tone board	Save \$20.00
EX711 Bearcat scanner external speaker	Save \$10.00
LC3000 Bearcat 3000XLT deluxe leather carrying case	Save \$10.00
BP2500 Bearcat ni-cad battery pack for BC3000XLT	Save \$10.00
ANTSGBNC glass mount antenna with BNC	Save \$10.00
ANTMBNC magnet mount antenna with BNC	Save \$10.00

Offer valid only on prepaid orders mailed to Communications Electronics Inc., PO Box 1045, Ann Arbor MI 48106 USA. Offer valid August 1, 1997 to August 30, 1997. Limit one coupon per item. Coupon is not redeemable with any other coupon or any other offer. Mention offer number AM.

CB/Ham Radios

Have fun and use our CB, GMRS and commercial radios to keep in touch with friends. For even bigger savings, *Monitoring Times* readers use the coupon on this page.

Cobra 148FGLT-A SSB CB with frequency counter	\$179.95
Cobra 29WXST-A CB with sound tracker technology	\$149.95
Cobra 29LTDWX-A CB with weather alert	\$109.95
Cobra 25WXST-A CB with sound tracker technology	\$129.95
Cobra 2010GTLWX-A SSB CB Base (\$125.00 shipping)	\$299.95
Cobra HH45WX-A Handheld CB radio with weather	\$89.95
Maxon GMRS210+3-A GMRS transceiver/SPECIAL	\$166.95
RELM RH256NBA 25 watt VHF mobile transceiver	\$284.95
RELM WH510-A 5 watt VHF handheld transceiver	\$284.95
Uniden GRANTXLA SSB CB Mobile	\$124.95
Uniden PRO538W-A CB & Weather	\$54.95

Bearcat Scanners

Monitor fire, police, weather, marine, medical, aircraft and other transmissions with your Bearcat scanner.

Bearcat 9000XLT-A base/mobile	\$344.95
Bearcat 3000XLT-A handheld	\$329.95
Bearcat 890XLT-A base/weather alert	\$209.95
Bearcat 860XLT-A2 100 channel base	\$149.95
Bearcat 760XLT-A base/mobile	\$179.95
Bearcat 230XLT-A handheld/SPECIAL	\$194.95
Bearcat 235XLT-A TrunkTracking scanner	\$269.95
Bearcat 178XLT-A base with weather alert	\$99.95
Sportcat 150-A handheld with 800 MHz.	\$144.95
Bearcat 80XLT-A handheld with 800 MHz.	\$129.95
Bearcat BCT7-A information mobile	\$149.95
Bearcat BCT12-A information mobile	\$169.95
RELM HS200-A handheld CTCSS/800 MHz.	\$224.95
RELM HS100-A handheld 100 channel	\$129.95

Digital voice logger

Why miss any radio or telephone transmissions when you can record everything with an affordable Eventide brand digital communications logger? You get powerful performance with a single DDS-2 DAT drive that records more than 500 channel hours of storage. When you want to record trunking systems, for even more recording time, the Eventide VR240 Mark III logger gives you over two months of unattended recordings on up to 24 channels when ordered with dual 8 mm. high density CT tape drives. All systems include 60 channel hours (250 & 500 hours optional) of instant recall. Ideal for quickly replaying emergency calls or radio traffic. FCC approved telephone interface is built-in and beeps are selectable on a channel-by-channel basis. Other options include GPS time sync.

VR204DAT4 4 channel, single DAT drive, 500+ channel hours	\$7,395.95
VR240DAT8 8 channel, single DAT drive, 500+ channel hours	\$12,295.95
VR240DAT16 16 channel, single DAT drive, 500+ channel hours	\$14,490.95
VR240DAT24 24 channel, single DAT drive, 500+ channel hours	\$16,685.95
VR240MM8 8 channel, single 8 mm. drive, 875+ channel hours	\$15,595.95
VR240MM16 16 channel single 8 mm. drive, 875+ channel hours	\$17,790.95
VR240MM24 24 channel single 8 mm. drive, 875+ channel hours	\$19,985.95
Option-add 8 more record channels to a VR240 8 or 16 channel	\$2,095.95
Option-add 2nd DAT drive to VR240DAT Mark III system	\$2,995.95
Option-add 2nd 8 mm. drive to a VR240 8 mm. Mark III system	\$5,699.95
Option-ECW40, satellite chronometer GPS for external time sync	\$1,895.95
Option-DTE, desktop enclosure for one VR240 Mark III system	\$449.95
Supplies-120 Meter DDS2 data grade DAT tape (box of 10)	\$374.95
Supplies-160 Meter Data Grade 8 mm. CT tape (box of 10)	\$374.95

Tape logging products are special order, call 313-996-8888 to order.

Buy with confidence

It's easy to order from us. Mail orders to: Communications Electronics Inc., P.O. Box 1045, Ann Arbor, Michigan 48106 USA. Add \$17.00 per weather station or radio product for UPS ground shipping, handling and insurance to the continental USA unless otherwise stated. Add \$12.00 shipping for all accessories and publications. Add \$12.00 shipping per antenna. For Canada, Puerto Rico, Hawaii, Alaska, Guam, P.O. Box or APO/FPO delivery, shipping charges are two times continental US rates. Michigan residents add state sales tax. No COD's. Satisfaction guaranteed or return item in unused condition in original packaging within 61 days for refund, less shipping charges. 10% surcharge for net 10 billing to qualified accounts. All sales are subject to availability, acceptance and verification. Prices, terms and specifications are subject to change without notice. We welcome your Discover, Visa, American Express or MasterCard. Call anytime 1-800-USA-SCAN or 800-872-7226 to order toll-free. Call 313-996-8888 if outside Canada or the USA. FAX anytime, dial 313-663-8888. Dealer and international inquiries invited. Order from Communications Electronics Inc. today.

Price schedule effective August 1, 1997. AD #080197AT © 1997 Communications Electronics Inc.

For credit card orders call
1-800-USA-SCAN
Communications Electronics Inc.

Emergency Operations Center
PO Box 1045, Ann Arbor, Michigan 48106-1045 USA
For information call 313-996-8888 or FAX 313-663-8888



DX Camping

Yes, I know, August doesn't exactly provide ideal conditions for distant reception (DX), but it may well be the only time you and your radio get away from man-made static and/or visit a new part of the world from which to monitor. And if you're on a beach near the salt-water, you're twice blessed!

[PIC]

Phil Gebhardt, author of this month's DX camp feature and a resident of Port Perry, Ontario, is an avid promoter of radio wherever he goes. He's pictured here giving an introductory shortwave presentation at a Barnes & Noble bookstore in St. Petersburg, Florida. The bookstore carries a wide range of radio magazines and books, including *Monitoring Times* and *Satellite Times*. Barnes & Noble encourages local hobby groups to introduce their activities to the community. (With sufficient notice we'll even give you complimentary magazines to entice the crowd.)

Arthur Jackson, KA5DWL, expressed his thanks to Phil Gebhardt for an earlier article on building a mediumwave loop (Nov 96), and credited the article with rekindling his 35-year love of mediumwave DXing.

"The article stirred my curiosity just enough to build one in my limited spare time. The results were better than I expected. Whether I used my Sony ICF-2003 or the 10 year old AM/FM Sony Walkman, stations barely audible suddenly sounded like local stations.

"I made several part and construction modifications:

1. Full size 365 pf capacitors are hard to find. Electronic surplus stores carry car radio AM/FM variable capacitors. Smaller but, just as useful.
2. I used adhesive Velcro strips to guide the wires around the ends of the crossed supports. The spacing is 1/16 inch, every other row is 1/8 inch.
3. If you are using a small radios (which mine are), mount a 1 inch by 4 inch board on a Rubbermaid, single level Lazy Susan. Mount wooden guards at each end of the board. The length should only be long enough to fit the radio and the loop antenna. Rotation becomes simple.

"My enthusiasm has resulted into the construction of two more loops. One for longwave (1/16 inch spacing, 200 ft. of #30 wire), and one for 1610-3500 kHz as described in the article. The longwave one has entered me into a new DX field (NBD Beacons).

"Currently, I am trying to figure out a way



Gebhardt shown giving an introductory shortwave presentation at the Barnes & Noble bookstore in St. Petersburg, Florida.

to take these loops with me on trips. I am concerned about how will these be accepted in my baggage. I only carry a portable personal tape player, Casio LCD TV, 2 Meter handheld, and my Sony ICF-2003 with antennas when I am on the road!

Another Reconstituted Radio Nut

Eric Tarini, N1YNT, of Marion, Massachusetts, wrote his gratitude to columnist Skip Arey. "After 35 years, I am getting back into the AM/shortwave listening that fascinated me when I was 11 and 12 years old, growing up in Detroit. My dad put up a random-length wire on the roof, and I'd listen to AM DX, hearing baseball games from faraway cities on my 6-transistor Matsushita (now Panasonic) — it seemed miraculous! We also had a very old shortwave radio from the 30s or 40s, back when all radios were furniture.

"A couple of months ago, I bought a shortwave radio, started listening to world band radio. I ordered a pile of *MT* back issues to catch up, and came across your 'mildew' column in the July 1996 issue. I loved *Electronics Illustrated* and *Popular Electronics* back then (around 1960-61 or so), even though I didn't understand most of what I read: I sure wish I had some of them today.

"I was also fascinated by amateur radio, but didn't know how to proceed. Back then, it seems like you needed a mentor, or someone who could point you in the right direction. Nowadays, there's a lot more, and a lot better, information about these topics.

"After Christmas, I bought a couple of study books on ham radio, and passed my

Tech Plus six weeks later, I'm still learning about all the 'new' stuff in amateur radio that's different from my childhood memory of it — so many new things like packet, QRP, tiny VHF transceivers, etc. But what really caught my eye was what you wrote about 'a ham transmitter for \$5 in 1960s dollars' that you built for under \$20 in 1990s dollars. I'd love to see what that looks like — and maybe build one. (One of my favorite pictures in the ARRL *Now You're Talking* book is of a CW transmitter built on a tuna fish can.)"

Tweaking the Crystal Set

Alert reader Howard, WA2AFD, noticed that there appeared to be two windings on the Quaker Oats box crystal set pictured on page 86 of the May '97 *MT*. He is correct. Author Ken Reitz elaborates.

"There are two tuning coils on the oatmeal box. The modification comes from old-time crystal set Guru Elmer Osterhoudt (now a silent key) who was issued the ham call 6NW in 1919 and who started Modern Radio Laboratories in 1932 and ran it until his death in 1987 at the age of 87. In a flyer he printed, following the publication of the 1970 *Mechanix Illustrated* article referred to in my piece, he added the extra coil saying, '...although the originals didn't use the primary winding [top coil]...this is essential if you want good selectivity in separating stations.'

"It's just more of the mystery of the crystal set. It's amazing what you can do with so little. Reprints of Osterhoudt's voluminous work with crystal sets were made available by Paul Nelson who resurrected MRL. However, reports in the *Crystal Set Society Newsletter* [P.O. Box 3026, St. Louis, MO 63130; fax 314-725-7062] indicate that MRL is again dormant. I was able to contact them in March of 1993 and received a number of the MRL reprints which detailed amazingly complex crystal sets. I didn't include them in the sources because of the unreliability of the company.

"However, nothing beats the masterly craftsmanship of K.E. Edwards' work in his *Radios that Work for Free* (published 1977—check with your library). He has elevated the construction of the crystal set to a fine art.

"Describing his 40 meter band crystal set he says, '...It will tune much above and below this, but the 40 meter band is where it will tune

(Continued on page 102)

TrunkTracker/Condor Special!!!

Extend the **TrunkTracker's** range with the famous, distance-increasing **Austin Condor High Gain Flex Antenna**—**FREE** with your TrunkTracker purchase from Grove!

Limited-time offer; A \$330 Value for only

\$299⁹⁵

Order the SCN 10/ANT 14 Special; Offer is valid only for orders placed between 8/1/97 and 9/30/97.

Plus \$8 UPS 2nd Day Air Shipping

\$10 US Mail
\$14 Canadian UPS
\$12.50 Canadian APP

\$29.95
Value—
FREE with
TrunkTracker
while offer
lasts!

UNIDEN'S SPECTACULAR TRUNKTRACKER IS NOW EVEN BETTER ...

...with Grove's signal enhancement package. Order your TrunkTracker between August 1 and September 30, 1997 and get the acclaimed twelve-inch Austin Condor flex antenna (\$29.95 value) absolutely **FREE**. The Uniden BC235XLT normally sells for \$299.95 by itself, but now you can order the TrunkTracker with one of the best multiband flex antenna on the market for only **\$299.95 FOR BOTH** (plus shipping; and you still get the standard Uniden factory antenna and other pre-packaged accessories!). Because you are ordering from Grove, you get premium second-day-air delivery for the cost of regular shipping (Compare our charges with others; some dealers charge close to \$20 for slower service!).

Unquestionably the most exciting scanner product in two decades—Uniden's new BC-235 XLT will follow those elusive 800 MHz trunking signals! Now you can listen and follow conversations on your local 800 MHz trunking system from law enforcement dispatch and tactical channels, fire and rescue calls, ambulances, federal government agencies, and many other services that use Motorola's trunking technology. You can also listen to conventional scanner communications in the 29-54, 108-174, 406-512 MHz bands (less cellular).

The BC-235XLT is designed to track Motorola Type I, II, III, Hybrid, Smartnet and Privacy Plus analog trunking conventions, which are extensively used in 800 MHz communications systems. (Note: trunking frequencies must be entered before they can be monitored.) Conventional scanner mode operation is similar to the BC-230XLT.

The revolutionary Austin Condor "rubber duckie" really makes a difference on handheld scanners. It's guaranteed to improve weak signal scanner reception—on all frequency ranges—over the original scanner antenna that comes with the TrunkTracker. The Condor, Grove product #ANT 14, normally sells for \$29.95 plus \$6.50 UPS shipping

"I haven't had this much fun scanning since the introduction of the first programmable scanner in the 1970s. The BC235XLT TrunkTracker really gets the job done on Motorola 800 MHz trunking systems."

— Larry Van Horn,
Assistant Editor, Monitoring Times



Phone or mail your order now—Take advantage of Grove's liberal trade-in policy for your old scanner, and **STEP UP TO 21ST CENTURY SCANNING!**

GROVE

Grove Enterprises, Inc.

7540 Highway 64 West
Brasstown, N.C. 28902
(800) 438-8155 US & Can.
(704) 837-9200
Fax (704) 837-2216

e-mail: order@grove.net
World Wide Web: www.grove.net

Check the Grove website for a review by Bob Parnass and updates on specifications, price and availability.

And On It Goes

Newt Gingrich hopes to cash in on the cell phone/scanner controversy of earlier this year. According to reports, he is thinking that the might sue Democrat Jim McDermott for any role he had in the release of the illegally taped phone call. According to Rep. John Boehner, Gingrich could take civil action against McDermott on the basis that he violated the Electronic Communications Privacy Act.

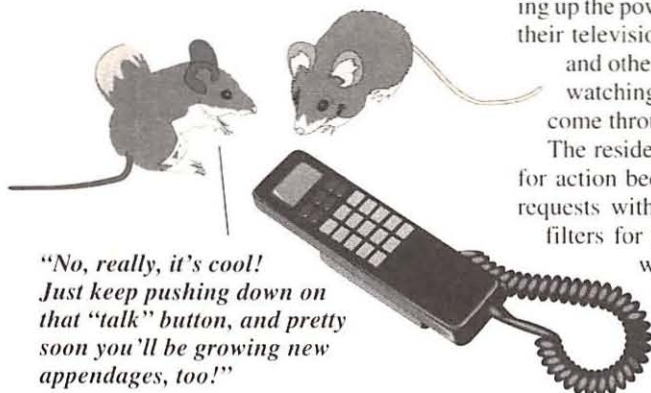
"We have been assured that the Justice Department considers the dissemination [of the tape] to be as illegal as the recording of the tape," says Boehner spokesman Terry Holt. However, the Florida couple who recorded the cell phone call was ultimately fined just \$500 each.

Double Digital Growth

The digital cellular phone market grew by a whopping 73% last year while the analog was up just 14%. According to the market research firm, Dataquest, however, Motorola is not sharing in the growth. Their sales of digital phones dropped 62% last year while Ericsson and Oy Nokia tripled. Some say Motorola's use of CDMA digital technology has dropped the anchor on its sales. Motorola disputes the numbers.

Double Cell Growth?

A study of mice exposed to radio signals similar to those given off by cellular phones may be the first concrete evidence linking the mobile phones with cancer. In an 18-month study, mice exposed to radio signals were twice as likely to develop cancer as their unexposed counterparts. Says John Moulder, professor at the Medical College of Wisconsin at Milwaukee, "It's certainly the first animal evidence that suggests that radio frequencies might cause cancer under some conditions."



Radio Waves Cure Snoring

Radio frequencies are now being touted as the cure for snoring. A company named Somnus Medical Technology has unveiled equipment that unblocks human air passages using radio waves. A radio frequency generator connected to a narrow needle penetrates the surface of the tongue, throat or soft palette and destroys a small area of inner tissue by

One way radio might be used to cure snoring.



generating heat between 158 and 176 degrees—"well below the boiling point," notes a company official. Seven to 18 million Americans suffer from sleep disorders. Five other companies—all owned by the same person as Somnus—also use radio waves to shrink swollen prostates and gynecological tissues, and kill cancer cells in lungs and kidneys.

Radio Waves Kill Civilization

CB radio. At one time it was America's favorite pastime, surpassing even baseball and sex. Now, unfortunately, the only time it gets any publicity is when an obnoxious CBER gets the neighbors going at a full boil.

In Ferndale, Michigan, 40 residents got together at a City Council meeting to demand action against a local CBER. According to residents, the unnamed operator uses a linear amplifier and torments neighbors by cranking up the power and cursing at them through their televisions, telephones, baby monitors and other electric appliances. "We'll be watching TV and hear a big 'f___ you' come through," says Tom Plain.

The residents have turned to city council for action because the FCC replied to their requests with a brochure on where to buy filters for their appliances. "It has to do with the product," says an FCC spokesman. If, however, the FCC determines that the CBER is using an illegal amplifier,

the FCC spokesman said that the Commission will then send the offending operator a warning letter.

Internuts

According to business week, internet growth continues at a staggering pace, doubling to nearly 40 million people. According to the Harris Poll, nearly 21% of all adults now browse the web, up from 21.5 million a year ago. The gender gap is closing quickly, too, with women now comprising 41% of all internet users. Other interesting data: 42% of all internet households have incomes of \$50,000 or more; 85% are white and 25% are in their 40s. The least common internet activity: shopping.

Internet II

One third of the state of Iowa doesn't have local internet service so, in 1990, the state formed the \$300 million Iowa Communications Network (ICN). The objective was to bring free internet service connections to school classrooms. This didn't go over too well. Phone companies and ISPs (internet service providers) complained that they couldn't compete with a state-subsidized network. GTE, which was to begin offering local internet access, canceled their plans. Two months ago, the people of Iowa—who also foot the \$37 million annual cost of the ICN—had enough and voted to get the state out of the telecommunications business, but the measure was vetoed by the governor. State legislators are now trying to figure out what to do with the \$300 million boon-dogle.

Iridium, Bill Gates, and Blimps

You may have heard of Iridium, the \$5 billion, 66-satellite telephone system. Using a palm-sized phone, you'll be able to phone to and from anywhere on the planet. The first five Iridium satellites are already in space.

Teledesic Corp. is looking to launch 228 satellites to provide high speed global wireless internet access. This one is a Boeing Corp project backed by Bill Gates.

Now comes word of yet another low-earth system called Sky Station International (SSI). Sky Station International is a \$5 billion network of 250 helium-filled—no kidding—"blimps" stationed 13 miles above the earth. The blimps will relay communications in much the same way as satellite. A new solar powered "air treading" technology will reportedly keep the blimps stationary for up to

10 years. SSI is asking the FCC for a portion of the 47 GHz band for their project.

Programmable "Oops"

Radio Shack recalled all unsold stock of their new HTX-204 dual band hand-held radio when it was discovered that it could be programmed to transmit and receive out of band. Tandy VP Bob Miller said that "Radio Shack would never knowingly do anything that would compromise our standing with the amateur radio community or the FCC." So what's the future for the HTX-204? Says Tony Magoulas, Tandy's Public Information Officer in Ft. Worth, "The radio is gone and will not be replaced."

Pull Off the Road or Pay

A Texas jury has ordered an 18-year-old girl to pay about \$7 million in damages to the family of a boy killed when she lost control of her vehicle while answering a cellular phone call. Kayla Segerstrom crashed her family van head-on into another car in 1996, losing control when she reached for the phone. A three year old boy was killed in the accident. His baby sister's neck was broken and their father suffered serious brain damage. The case is said to be precedent-setting because it addressed the issue of responsibility in an accident caused by the use of a cellular phone.

Dead Air

Hundreds of radio stations in Ohio, Florida, and Louisiana were forced to transmit nothing but dead air when a closed-circuit Emergency Alert System test from FEMA jammed. A test, intended for just WLS in Chicago, affected all the other stations in the system when a FEMA operator failed to deselect stations in the other states. WLS, a primary entry point station, requested the test as it was completing installation of equipment to receive national level alerts.

Fred... Fred... What's going On?

Traffic at the airport in Groningen in the Netherlands was tied up for about 20 minutes earlier this year when pilot Wim de Nijs used air traffic control frequencies to serenade listeners with the theme from the Flintstones TV show. Clasp the microphone of his small aircraft and circling the airfield, De Nijs sang, "Flintstones. Meet the Flintstones, they're a modern stone-age family..." until one Air Traffic Controller thought of calling in the Dutch air force and having the cave man

"Oh, I know!
How about this:
'Jailbirds. Meet
the Jailbirds,
we're full of fun
and good
friv-o-li-ty ...'"



shot out of the sky. Calmer thoughts prevailed, however, and De Nijs was ultimately sentenced to four months in prison. No word on what song the Dutchman is singing now.

Television in Russia

After the fall of the Soviet Union it was hoped that Russia might begin to learn some lessons from the United States: democracy, capitalism... tabloid TV? It hasn't taken long for familiar trash to slither onto the Russian airwaves. Hosted by Vladimir Pozner, an apologist for the communist regime often seen on the Phil Donahue Show in the 1980s, is a bizarre show called, "Person in the Mask." Guests appear in the studio behind hideous metal masks. Topics include pimping teenage boys, a KGB agent who heads a powerful drug mafia, and old standard fare like adultery.

To Catch a Jammer

Police in Grand Rapids, Michigan, were trying to catch a woman who had robbed a

bank. Whenever dispatchers tried to communicate with pursuing officers, their transmissions were jammed. The robber escaped.

This was not the first time. Grand Rapids police transmissions have been jammed 35 times in the past two years. When police sent out an engineer with direction-finding equipment, they zeroed in on a man sitting in a Ford Escort. A large antenna was on the car's roof. When dispatchers broadcast a description of the car, the jamming stopped.

Police obtained a warrant and searched the man's house. Seized were at least a dozen hand-held radios, a half-dozen walkie-talkies, seven two-way radios, microphones, speakers and other transmitters. Though his name has not been released, the man is said to have been a volunteer sheriff's deputy and the traffic squad's communications officer.

Communications is compiled by Larry Miller with help from Rachel Baughn, and the art department at Grove Enterprises. Also on staff as official "Communications" monitors are the following good people who look for, clip out, and mail items of interest from their local newspapers: Anonymous, Albany, NY; George Beard, Kansas City, KS; Chanel Cordell, Brasstown, NC; Kenneth Dunn, Glassboro, NJ; Maryanne Kehoe, Atlanta, GA; Mr. and Mrs. Kevin Klein, Kimberly, WI; Ira Paul, Royal Oak, MI; Richard Statefield, Brooklyn, NY; Walter Szczepaniak, Philadelphia, PA; Peter Tams, Los Angeles, CA; and Michael White, Greensboro, NC. We also consulted the following publications and list their names in grateful appreciation. Dispatch Monthly, National Scanning, Radio World, Russia Review, Satellite Times and W5YI Report.

Rave Review
Pop Comm
April '96

SEE US ON THE WEB!
www.vikingint.com

Professional 10 HOUR RECORDER
"BUILT LIKE A BATTLESHIP"

- Heavy duty commercial recorder - NOT improvised from consumer models
- 12, 14, and 16 hour models also available
- BUILT-IN voice activation (add \$30)
- Applications information included
- Dimensions: 11.5 x 7.0 x 2.75"

COD's OK. Calif. residents add tax. Sorry, no credit cards. Free catalog USA only, other countries \$5.

FREE
16-PAGE
SPECIAL EQUIPMENT
CATALOG!

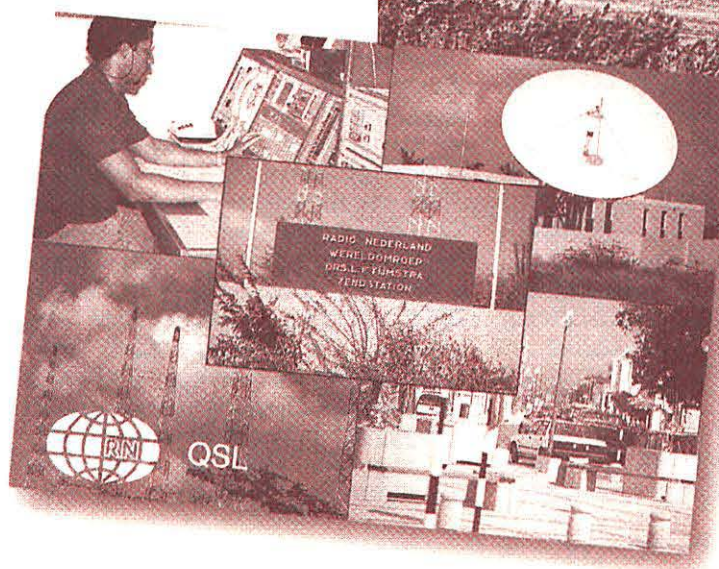
\$159

..Includes UPS to 48 States

Viking International 150 Executive Park Blvd. #4600 San Francisco, CA 94134
Factory Direct Phone: (415) 468-2066 • Fax: (415) 468-2067 "Since 1971"

Radio Netherlands Hits

The Dutch have a saying about a 50th anniversary. It goes: one has "attained their Abraham," a biblical reference to age, grace and wisdom. As Radio Netherlands reaches the half century mark, it lives up to that saying.



By Jeffrey M. Poulin, KF4JSV

It is 6:28 p.m. in Virginia. As usual, my shortwave radio is tuned to 6165 kHz. The lilting refrain of a traditional Dutch folk song, "Merch Toch Hoe Sterck" begins. The announcer's voice says "This is Radio Netherlands, the Dutch international service."

First comes news and commentary on topics that are seldom mentioned on our evening news reports. You probably won't hear about the O.J. Simpson trial (reason enough to listen to shortwave). But you can learn about the upheavals in Albania, which can affect U.S. troops in the Balkans. Or the successful launch of a new satellite by the European space agency, rioting in Africa, unrest in mainland China,

Dutch pork production, and the status of the European Union. The commentary helps put the stories in context for better understanding. The presentation rivals that of the BBC in my opinion.

What follows is just plain fun. Programs can cover any topic. One program will discuss the latest trends in music. The next broadcast might delve into the history of Gypsies in Holland, the legacy of the Marshall Plan, the Trappist Monk brewing industry, or environmental concerns. One of my favorites was a program about the changing customs of handshaking over the last 300 years. (I know what you're thinking: but that program actually turned out to be an entertaining

history lesson in European culture.)

1997 marks the 50th year of Radio Netherlands doing its job, and doing it well.

■ In the Beginning

Although Radio Netherlands officially started in 1947, its roots go back 30 years earlier. In 1917, Phillips, the Dutch electronics company, began making tubes for the fledgling radio hobby and industry.

Ten years later the Netherlands became the first European country to set up a regular international broadcast schedule. That station, PCJ, was established as an economical and very efficient way to communicate with the Dutch colonies in various parts of the world. Those colonies, especially Indonesia, also provided a market for the radios made by Phillips. Other European countries followed the Dutch lead. Within a few decades, most of those colonies would be independent countries, but their existence served as a significant catalyst in developing overseas shortwave broadcasting.

In 1928 Eddie Startz began a Sunday institution that would continue for over 60 years. Saying that the call sign PCJ stood for "peace, cheer, and joy" the Happy Station program went on the airwaves. His show's motto was the "happy station of a friendly nation." Significantly, the listener no longer had to speak Dutch to learn about the musical taste and cultural matters in Holland. And it proved that there was an audience for programs "with a Dutch accent."

The 1920's and 1930's also saw the establishment of four domestic services, each with an affiliation in religion or politics. These affiliations still pertain today. However, there was no unified, national voice going out to the world. Therefore, in 1937 The Hague (seat of the Dutch Government) appointed a commission to study the matter. It recommended an overseas shortwave service made up of existing domestic programs but run by a small, independent staff.

What might have formed Radio Netherlands was never realized. Before the new service could be established, the Nazis invaded Holland.



Weatherman Jan Pelleboer shown in 1974 photo.

■ World War II and British Influence

Holland was occupied quickly. The Nazis immediately took over the domestic radio services for propaganda and security purposes. The Dutch staffs were ordered to continue operating the stations under their new masters. Although this so-called collaboration was involuntary, it led to antagonisms after the war that would last for years.

With Holland occupied, a Dutch newspaper reporter in Paris, Hendrik van den Broek, got together with several colleagues and started clandestine radio broadcasts to Holland using French facilities. But France itself was falling to the Blitzkrieg, and the group escaped to London before Paris was taken. There they began Radio Orange, named for the Royal House of Orange, the official voice of the Dutch government in exile.

Using the BBC's Bush House facilities and powerful transmitters, their broadcasts were used to assist the Dutch underground and help maintain morale among their occupied countrymen. (BBC resources were used by several countries for the same purposes.)

By the autumn of 1944, a few months after D-Day, the southern half of Holland was liberated. Van den Broek and his team moved

back and began Radio Herrijzend Nederlands in Eindhoven. This was the station that announced the end of the war in Europe to the Dutch people.

Van den Broek, now a Major, was given authority over the established domestic stations in Hilversum. Among other duties, it was his responsibility to remove those staff members who had worked under the Nazi occupiers. This was the official government policy, not his own, but van den Broek bore the brunt of

the resentments that arose. Many of these people, well-known voices in the Netherlands, never forgave van den Broek for the way in which he carried out this policy.

Another problem developed over the 'tone' of the domestic services. Van den Broek had been heavily influenced by the understated, precise tone of BBC broadcasts. Dutch stations, indeed most of those in Europe, had had a more exuberant presentation before the war and expected to pick that up again. The clash of these expectations with van den Broek's wartime BBC influence caused more hard feelings.

The desires of the domestic broadcast services could not be easily ignored as they represented four influential parts of Dutch society: the Catholic and Protestant churches, and the two primary political factions. However, that still didn't answer the pre-war goal of a unified, distinctly Dutch voice for the world to hear.

■ Birth of a Station

A transitional stage began in 1946 for a Radio Netherlands. Part of the proposed station was a world service that would provide



Media Network crew: Diana Janssen and Jonathan Marks.

Software for the Shortwave Listener...

SWBC Schedules - Broadcast frequencies and programs, updated weekly+... **\$35/year**

Smart R8 Control - Smart control for the popular Drake R8 and R8A... **\$2500/\$4000**

Smart Audio Control - Add an audio scope and spectrum analyzer to your PC... **\$2500**

SWBC Interval Signals - Turn your PC into a virtual shortwave receiver... **\$500/\$3000**

FineWare

11252 Cardinal Drive * Remington, VA 22734-2032
<http://www.crosslink.net/~mfinel>



the long-desired unified voice. Van den Broek vigorously promoted the idea of a world service, obtaining government funding, a separate staff, and virtual independence from government interference. The quote below explained his broadcast philosophy.

"There are really two reasons for the existence of Radio Netherlands and we do our work in two ways. Through our foreign language transmissions and through our transcription service, which produces and records programs on any phase of Dutch culture, we try to tell the rest of the world about life in the Netherlands, our institutions, and traditions. The other reason for our existence is our broadcasts in the Dutch language. As you know, many thousands of our countrymen emigrate each year to find a new life in a strange land. It's our aim, in our Dutch broadcasts, to supply a link between the homeland and the new country, to try to ease the shock of the completely new environment by providing news and entertainment straight from home."

With that philosophy as a guide, Radio Netherlands was officially launched in 1947.

Radio Netherlands faced opposition from the domestic stations from the start. They still resented van den Broek. They had assumed, based on the pre-war plans, that they would provide the programming for any world service. And the new station was a competitor for funding.

But the domestic services all had their own agendas and affiliations. Radio Netherlands did not. At that time the Dutch Government was eager to retain control of its Indonesian colonies. The Hague found it could rely on Radio Netherlands to broadcast accurately the Government point of view. The ploy, as a propaganda move, failed. Indonesia obtained its independence. But by that time, Radio Netherlands had established itself as a reliable, unbiased source of news and programming.

■ Distinctively Dutch

The first staff members knew they needed a plan to keep audiences interested while establishing a distinctive Dutch identity. The United States was the pre-eminent industrial and military power with world-wide influence. England's colonial empire was shrinking, but it still headed a Commonwealth that spanned the planet and worked from a tradition of authority in its broadcasts. France, even after five years of occupation, simply assumed a high degree of influence and acted accordingly.

The Netherlands is a small country. It is half the size of South Carolina with a population only a little more than New York City. The staff knew that what goes on in Holland is not necessarily earth-shaking. They realized a modest approach in their programming, as long as it was entertaining and informative, could lure an audience. Af-

ter all, the Netherlands has centuries of culture and history to draw on, magnificent artwork, orchestras, and a friendly, outgoing populace. There was no lack of material available.

If they weren't going to shout, they would make their broadcasts fun and conversational. This would not be "The Netherlands, the Country," broadcasting to other countries: It would be Dutch people talking about matters of fun and interest to other people.

The first English language broadcasts consisted of twenty minutes of news and commentary three times a day. Audiences wrote in wanting to know more about the place producing these reports, which led to programs on Dutch culture and popular tastes. At first the programs focused on the symbols of Holland: windmills, wooden shoes, tulips, and so forth. But it didn't take long to go beyond that. A similar approach was employed in all the languages they used in their broadcasts.

Even though shortwave radio was their primary means to disseminate programs, they didn't rely on it alone. The station produced records of classical music and other programming, using the finest technology available, and sent them all over the world to be played by local stations as part of Radio Netherlands' transcription service. These transcriptions had the added benefit of being able to target specific audience needs. At one point in the 1950's they were sending out 150,000 recordings a year.

Program content was never considered sacred. It was changed to reflect changing tastes in the Netherlands and among the audiences. In the 1950's there was a shift from classical to jazz and folk music. In the 1960's audiences wanted more informative programs. Listeners could now get high quality music recordings from many other sources but the documentaries Radio Netherlands produced could not be found elsewhere. The current blend of programs dealing with cultures, history, education, and current events—some serious and some lighthearted—is a result of meeting the audience's wishes.

Technology for Tomorrow

Radio Netherlands always used the best technology to communicate with their audience. At first that was shortwave radio, records, and program guides sent by mail. It was among the first to use satellite relay stations to improve reception, such as the relay in Bonaire. Television, satellites, and the internet have all been brought into play as means to accomplish their goals.

For all the changes in technology, Radio Netherlands has not forgotten its purpose:





Ginger da Silva, host of *A Good Life*, conducts an interview.

to make the world aware of the Dutch people and culture. In the United States we generally hear the shortwave broadcasts. But Radio Netherlands is increasingly involved in television productions, often in collaboration with other countries. The old records have been replaced by top quality CDs of Dutch composers by Dutch performers. Satellite transmission of sound and picture lets them provide educational material in Latin America and Africa. The internet allows Radio Netherlands to maintain ever more information related to its broadcasts. Above all, the new technology permits the staff to target each audience with timely and relevant material.

A measure of the success of this approach is that their English language programs are carried by stations in Australia, Canada, and South Africa for domestic broadcasts. They recently opened a New York office to promote domestic radio coverage in the United States.

What about shortwave radio which started it all? It's not going to go away any time soon. After all, the gear is relatively inexpensive, light, easily powered, and available even in less developed areas. And there is no gatekeeper or intermediary to break the lines of communication.

Something that won't change is the voice of Radio Netherlands: "the European station with the Dutch accent." Even with the pro-

posed unified Europe, languages and the differing cultures will not disappear. The station has established an identity of its own that will continue its mission and traditions.

■ A Golden Half Century

Radio Netherlands has a rich history. There have been the serious domestic events, such as when the Queen of the Netherlands announced her abdication in favor of the next royal generation. There have been moments of fun. One April First broadcast gave the wavelengths, straightfaced, in feet and inches instead of meters. Or the undiscovered open microphone that sent a program production session over a satellite sub-carrier.

Radio Netherlands has always encouraged audience feedback and suggestions. Different views from around the world let the staff respond to changes in their listeners' needs and wants. This willingness to change is one of the reasons for Radio Netherlands' ongoing and increasing popularity.

Jonathan Marks, Director of Programs, revealed another reason. "Maybe [we remain so popular world-wide] because we're independent and we genuinely care about listeners. We listen to you because you listen to us. I don't think we're ashamed to admit we enjoy what we're doing, and that comes across in the way we compile the programs. This is a small country, so we have to try harder to share our information with others. Other countries shout information. We don't think that works [for us] in 1997."

Is Radio Netherlands meeting its goals? I believe so. With entertainment and information it provides a window into the Dutch world. And it makes me want to know even more about the country and its people.

■ Contacting Radio Netherlands

The station can be reached in a number of ways. The mailing address is: Radio Netherlands, English Department, PO Box 222, Hilversum, Holland. Telephone: +31 35 672 42 22 (in the U.S. the number should start with 011). E-mail: letters@rnw.nl

The staff always enjoys hearing from you with comments on their programs or even with suggestions for future shows. They also offer the usual goodies, such as QSL cards, post cards, bumper stickers, etc., as well as catalogues of their music recordings and television programs. Specify that you want the English language version.



Bumper stickers in four languages attest to RN's global reach.

Radio Netherlands also sends out upon request, at no charge, a quarterly newsletter with backgrounds on the staff, what's going on at the station and upcoming shows. I especially like it because it gives the schedules and topics for their excellent documentaries. Again, request the English version.

Don't want to wait for the mail? Radio Netherlands maintains a web site at: www.rnw.nl. In addition to station and program information, the web site offers real audio of programs, reading suggestions for books and magazines related to radio (including *Monitoring Times*), and links to other sites of interest.



The Roughly Speaking crew (from left): Max, Simone, Howie and Reza.

Performance Upgrades

JRC NRD 525/535 AOR AR-7030
Sony ICF-2010 Yaesu FRG-100
Lowe HF-150 and AP/SP-150 RS DX-394

Kiwa offers a variety of performance upgrades for the following receivers which include filter modifications to audio enhancements. Contact Kiwa for details or visit our web site for complete information.

Kiwa Electronics

612 South 14th Ave., Yakima WA 98902
509-453-5492 or 1-800-398-1146 (orders)
kiwa@wolfe.net (Internet/full catalog)
<http://www.wolfe.net/~kiwa>

Send Your Receiver to Camp



By Philip
Gebhardt,
VA3ACK

It doesn't matter if you DX on the longwave bands or the shortwave bands, the lament is always the same: The antenna isn't long enough (or high enough). Or, it may simply be that you're tired of using the same old antenna. It could be that your shack is located in a noisy environment so you can't dig those weak signals out of the noise.

So what do you do? You organize a DX camp.

Depending on your needs and the camp site, your DX camp may involve only one person—you. At other times, you may want to get a small group of listeners together. If you're really ambitious, you could involve dozens of radio enthusiasts. There's something to be said for each type of camp.

The main criterion in any case may be to find a site where you can string up a really long antenna—perhaps a beverage—or a



Picnic tables provide plenty of room to lay out equipment at the one-day DXpedition at Simeon Park organized by Joe Karthaus. The building provides shelter from the cold and wind, but easy entry for antenna lead-ins. Here Bernie Rataj has his mediumwave loop ready for DXing. (Photo credit: Jack Henshaw)

really high antenna. You might want to experiment with several antennas. Or maybe what you need is a place where the noise level is lower than it is at home.

If you only have access to a small space, then you may have to limit this year's camp attendance to you. My experience, however, has been that the event is always much more fun when you have company. It's easier to erect antennas with an extra pair of hands available. If you have a camp buddy, you can each put up an antenna and part way through the camp you can swap antennas. There is also the thrill of having someone to tell when you hear a really great DX catch. Conversely, your listening buddy can provide you with hot tips that you otherwise might miss.

Expanding the camp from a small group to a larger group increases the number of

(Continued on Page 14)

WiNRADiO™

Radio technology is about 100 years old.
Personal computers are about 20 years old.
Two significant technologies that changed the world.
Now united in WiNRADiO.
The world's most surprising communications receiver.

INTRODUCING



The recent addition of our SpectrumScope to the increasing number of WiNRADiO features has opened a new door of possibilities, never available in the scanner world before. Our patented Visitune™ feature is one of them. Called "the ultimate scanning sensation" by one of our beta testers, Visitune™ brings a totally new experience to scanning. Imagine dragging your mouse across a scanned spectrum; click on a peak and you are tuned - then hold the mouse button down and keep dragging the frequency cursor. The receiver will tune continuously, smoothly following your hand movements, with the frequency spectrum visible in the background. You can also make the spectrum display update behind your cursor as you sweep. And, if you ever wondered why we made it possible to use more than one WiNRADiO in a single PC - now you will know; the background spectrum can show the situation on a band in real time while you are exploring the frequencies with your second receiver!



The WiNRADiO card: plug it in and transform your PC.



The WiNRADiO software: enjoy the virtual control panel.



The optional WiNRADiO Database Manager

WiNRADiO Advantages

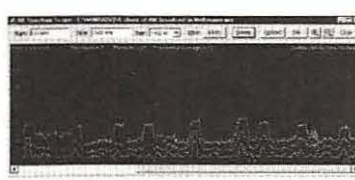
- WiNRADiO front-panel functions are more flexible and powerful than those of a traditional radio.
- WiNRADiO has practically unlimited memory capacity and can be customized for specialized applications.
- New functions, for example databases, can easily be integrated with WiNRADiO.
- A single PC can contain and control more than just one WiNRADiO. Observe activity on several bands simultaneously.
- The processing power of a PC can be used to process WiNRADiO signals, using a Sound Card.
- The new patented tuning feature of WiNRADiO called Visitune™ makes using a radio receiver a new and enjoyable experience.
- No cables and power supplies are needed to use WiNRADiO with your PC. Get rid of that clutter on your desk!
- Programmer's information is supplied for special applications development.
- Specially developed shielding materials and innovative design methods prevent PC-generated interference from entering the receiver.



Easy to install!



Join the WiNRADiO Club!



See the bands with our Spectrum Scope!

WiNRADiO, VISITUNE and the VISITUNE logo are trademarks of WiNRADiO Communications.

For the latest information on WiNRADiO visit us on <http://www.winradio.com>

Dealers

USA

Advanced Digital Systems
St. Louis, MO
(314) 791-1206

Amateur Electronics Supply
Milwaukee, WI
(800) 558-0411

CB City
Westhaven, CT
(203) 932-3832

Electronic Distributors Corp.
Vienna, VA
(703) 938-8105

Electronic Equipment Bank
Vienna, VA
(800) 368-3270

Grove Enterprises
Brasstown, NC
(800) 438-8155

Professional Wireless
Orlando, FL
(407) 240-2880

Radio City
Mounds View, MN
(800) 426-2891

Radioware
Westford, MA
(800) 950-9273

Scanners Unlimited
San Carlos, CA
(415) 573-1624

SSB Electronic USA
Mountaintop, PA
(717) 868-5643

The Communication Source
Arlington, TX
(800) 417-8630

The Ham Station
Evansville, IN
(800) 729-4373

Universal Amateur Radio
Reynoldsburg, OH
(800) 431-3939

Canada

Atlantic Ham Radio Ltd.
Downsview, ON
(416) 636-3636

Durham Radio
Oshawa, Ont.
(905) 436-2100

Dealer enquiries invited.
info@winradio.com

Joe Karthaus, organizer of the one-day Simeon Park DXpedition, uses his portable with a telescoping antenna to check signals against his receiver connected to an outdoor random-length antenna. (Photo credit: Jack Henshaw)



The cabin that Ken Alexander uses during his DX camps. The rural location near Coe Hill, Ontario provides noise-free listening while the trees and large lot size provide plenty of room for antennas. (Photo credit: Ken Alexander)

Harold Sellers (right), editor of the ODXA's DX Ontario magazine, enjoys a few quiet moments at his receiver during the ODXA's shortwave camp in Mansfield, Ontario. Harold's experience in DXing provides a wealth of information for both newcomers and veteran DXers.



The two-story building used for the ODXA's shortwave camp held each November provides shelter from the cold, a dining area for meals, sleeping quarters, a large common area for DXing and easy access to trees. The building is part of the Mansfield Outdoor Education Centre used by groups of students during the week. (Photo credit: Jack Henshaw)



Charlie Diamond tunes in to some DX at the ODXA's shortwave camp at the Mansfield Outdoor Education Centre in Mansfield, Ontario. The camp offers members an opportunity to compare equipment, discuss techniques and share DX tips. (Photo credit: Jack Henshaw)

hot tips, especially if you have a board on which to display the information as each DX catch is made. It can also increase the variety of antennas, although random-length wires often seem to predominate because of their simplicity.

What starts to happen at the larger DX camps is increased interaction. The camp almost becomes a social event. Novice listeners can get advice from the veterans; participants can compare receivers and accessories; the merits of the latest gadget on the market can be discussed. It's a bonus that all this happens spontaneously. There's no need to formalize the process with a program.

One thing is certain: Whether your camp is small or large, there are no rules. You organize the event however you want. Within the Ontario DX Association, there are always several such events in various stages of development.

When I have had the chance to exchange the noise of the city for the radio-quiet conditions in a rural setting, I've packed my receiver and seized the opportunity. I may take along a roll of wire or a prefab antenna. Obviously, organization is at a minimum.

Slightly more elaborate is the event organized by Joe Karthaus. He works for a company that owns a park. The park facilities are available to employees and their families throughout the year. Through the kindness of the company and the park staff, we have become Joe's extended family. The heated chalet provides protection from the winter weather and electricity eliminates the need for battery-operated receivers. The indoor washrooms make life easier, too! But best of all, there are large trees and wide open spaces for antennas.

What makes Joe's DXpedition easy to organize is that it is only a day-long event. We start DXing in the morning and pack up at night. Our main concerns are what band to listen to and when to eat.

Ken Alexander organizes a slightly more elaborate event because he has access to a cabin. He invites small groups (about six) to enjoy the DXing opportunities the rural location affords. Three-hundred-meter (1000-foot) random-length antennas are the order of the day. The wire is fed into an impedance matcher and then through coax to the receiver. Because several listeners might want to connect simultaneously to a single antenna, the club's multicoupler comes in handy in this situation. (A multicoupler allows several receivers to be connected to a single antenna.)

The organization is still minimal, but certain things need to be addressed. Since the

cabin is rented, Ken must collect money from the participants. Will the group eat together or will participants be responsible for themselves? Are there enough beds for everyone? I decided to take advantage of the opportunity to do some TV DXing using the rotatable beam at the cabin only to find out that the rotor caused interference on the lower bands. Oops!

Beyond that, the ODXA has an annual shortwave camp (although some members DX the medium and longwave bands while others move up to the FM band).

Because this event can involve two to three dozen members, a committee of four members headed by Jack Henshaw, the ODXA's current chairman of the board, oversees the camp organization.

Facilities are rented from the Mansfield Outdoor Education Centre for Friday night through Sunday afternoon. Meals are supplied by the center and sleeping accommodations are dormitory-style with bunk beds. A single listening area allows all participants to be together to facilitate exchanging hot DX tips. A blackboard is used to list stations and frequencies as they are heard. The club's multicoupler (several dozen receivers can be connected to a single antenna) gets a good workout at the camp.

Experience has made organizing the event easier throughout the years. Experience has also taught us not to over-organize. The social aspects of the camp tend to keep things flowing smoothly simply because there are so many members in attendance. While organizing the camp is easier by committee, for many years two semiannual camps were singlehandedly organized by Steve Canney. That's not to say it was an easy job for Steve — just that it is possible for a single person to organize such an event.

■ The Antenna's the Thing

Over the past several years, we have encouraged members to try different antennas. For *MT* readers who wish to try some antennas that have already been tested and proven, here are some of the types we have used at the Mansfield site. You can try these either at your DX camp or at home.

RANDOM-LENGTH WIRES

In many cases, members simply string up random-length wires. True, they are often long wires (sometimes 100 to 300 meters long), but equally often they are simply



One of the attractions of a DX camp is the opportunity to try out new antennas. Here, Ontario DX Association chairman Jack Henshaw (center) holds a homemade quarter-wave vertical antenna in place as Norma Kennedy hammers pegs into the ground to act as anchors for guy ropes and Harold Sellers unrolls wire to be used as radials.

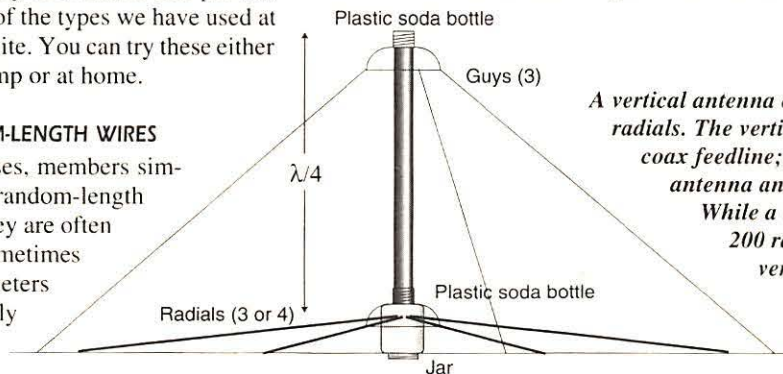
connected directly to the receiver input. The random-length antenna is attractive because of its simplicity and because it can be used over a wide range of frequencies.

Ken Alexander has designed a longwire impedance matcher that he now manufactures and sells. The baluns were one step in improving the performance of these antennas. Adding a balun is one of the simplest improvements you can make. Often Ken strings up 300 meters of wire that he then connects to a balun and through coax into the input of the multicoupler. This enables those members who want to attend the camp, but aren't particularly knowledgeable about antennas (or perhaps simply not interested in antennas) to participate.

In an effort to peak performance on specific bands, I erected several antennas on different occasions.

THE QUARTER-WAVE VERTICAL

One of the easiest antennas to erect is the quarter-wave vertical shown in Figure 1. One of its advantages is that it re-



ceives signals from all directions. The length can be calculated using Equation #1:

$$L = 75000/f \quad (1)$$
 where L is the length in meters of the vertical section as well as the length of each ground radial, and f is the frequency in kHz. (If you want the length in feet, use $L = 246000/f$.)
 I generally select the middle of the band as the frequency. For example, for the 13-meter band, I would use 21650 kHz. In that case, the length (L) becomes $75000/21650$ or 3.46 meters.

Listeners sometimes avoid using vertical antennas because of the support problems. The vertical section (made of 13 mm or 1/2-inch copper pipe) must somehow be held in place and it must be insulated from the ground. Insulating the antenna is easy if you take a lesson from commercial broadcast stations. I set the antenna on a glass insulator. Not the type they use at broadcast stations—they're too expensive and they are designed for high power transmitting applications. Instead, I use a glass jar, such as a jam jar. The outside surface of the jar bottom is often concave. I invert the jar, sink it into the ground slightly and place the antenna on the concave bottom.

Supporting the antenna in a vertical position is almost as easy. You'll need two plastic soda bottles. Cut the top off both bottles and discard the bottom part. You also need one of the bottle caps. The first bottle top is simply placed over the top of the antenna and dropped to the bottom where it covers the jar. This bottle helps keep the antenna on the jar. The second bottle (with the bottle cap screwed on) is placed at the top of the antenna. Three guy

FIGURE 1

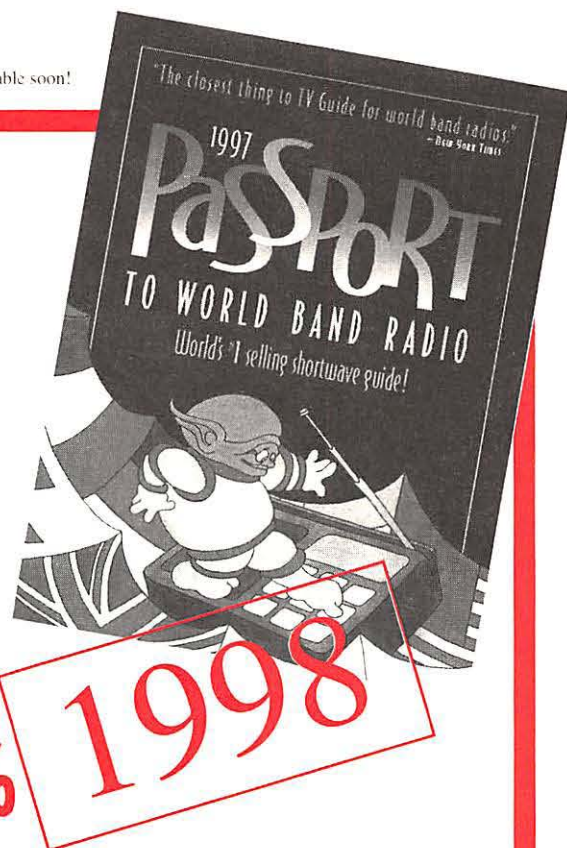
A vertical antenna consists of a single vertical leg and a set of radials. The vertical leg attaches to the center conductor of the coax feedline; the radials are joined at the base of the antenna and connected to the outer conductor of the coax. While a commercial broadcast station might use 100 to 200 radials, you'll only need three or four. In this version, the vertical leg is insulated from the ground using a glass jar as an insulator. The top of a 2-liter soda bottle and three guy wires support the top of the antenna.

Note: 1997 cover shown. New cover art available soon!

Time to Update your *Passport*?

Announcing Grove's Pre-publication
Special on the 1998 edition of **Passport to
World Band Radio**. Order now and...

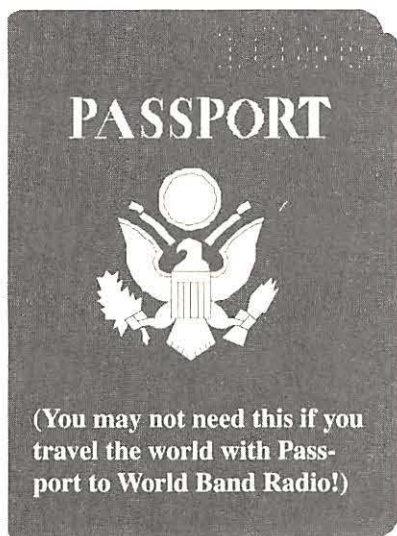
LAST CHANCE to save 34%



Edited by Lawrence Magne, *Passport* features a listener's program guide, arranged both by frequency (2-26 MHz) and easy-to-follow time chart. Listings show transmitter output power, language, favored listening times for North America, and program contents. Reviews of the most popular short-wave receivers and listening accessories. Special alphabetized section of station addresses, contact personnel, phone/fax numbers.

Order before August 31,
1997 and the 1998 edition
of *Passport* will be yours
for only

\$16.95



GROVE

Grove Enterprises, Inc.
7540 Highway 64 West
Brasstown, N.C. 28902
(800) 438-8155 US & Can.
(704) 837-9200
Fax (704) 837-2216
e-mail: order@grove.net
World Wide Web:
www.grove.net

with
FREE SHIPPING in US.
(After August 31, the price will
be \$19.95 plus \$6.00 shipping.
Books will ship around mid-
September. Order BOK 18-98.
For foreign shipping, please
add \$4.50 for foreign surface
printed mail, \$6.00 for Air Mail
in Canada, and \$7.50 for Air
Mail elsewhere.)

\$9.00 Off!

Regular price plus shipping

wires (or plastic line) can be attached through holes you punch in the plastic.

Place three or four radials along the ground, attach the coax feedline (inner conductor to the vertical section; outer shield to the radials) and you're ready to receive shortwave broadcasts.

Our DX camp version of this antenna was designed for the 13-meter band.

FULL-WAVE LOOP

As its name implies, this antenna uses one-wavelength of wire. Construction is fairly straightforward—you form the wire into a square (each side is a quarter-wavelength long) and you string it up in the trees. See Figure 2.

Place an insulator at each of the four corners. The top two insulators are used to attach the antenna to tree branches; the lower two insulators are attached to anchor points in the ground.

The feedpoint of the antenna is at the middle of the bottom leg.

If you have the required height, you can rotate the square and mount the antenna in a diamond configuration. The feedpoint becomes the bottom vertex. Only one tree is needed to support this configuration.

Another variation is the delta loop. The wavelength of wire forms an equilateral triangle rather than a square. Normally, delta loops are suspended with the horizontal base at the top and a vertex near the ground. The easiest place to attach the coax feedline is at the vertex near the ground.

Equation #2 is used to calculate the total length of wire required for square loops and delta loops.

$$S = 306324/f \quad (2)$$

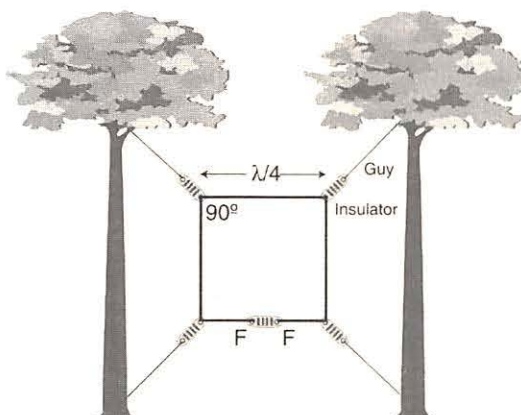
where S is the length of one wavelength in meters, and f is the frequency in kHz. (For feet, use $S = 1005000/f$).

For the 13-meter band, you'll need 306324/21650 or 14.15 meters of wire. (Each leg of the square will be 14.15/4 or about 3.54 meters long.) We actually used this antenna on the 25-meter band.

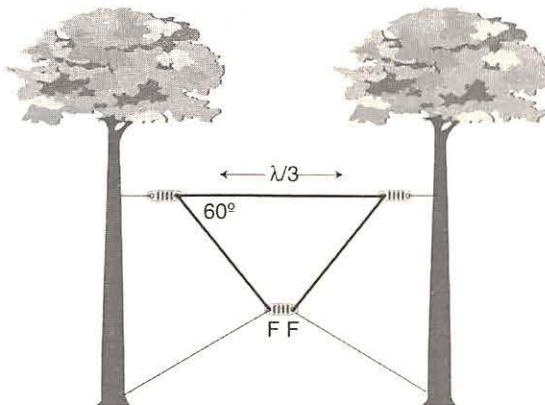
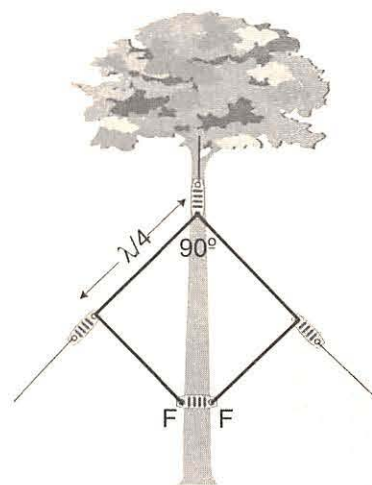
INVERTED L

Quarter-wave vertical antennas and full-wave loops are useful antennas on the higher bands where their dimensions are manageable. On the lower frequencies, we needed something else. The inverted L provided the answer. As shown in Figure 3, it is simply a bent quarter-wave vertical antenna. The overall length is determined from Equation (1).

This antenna lends itself well to wire rather than copper pipe construction. Each end of the horizontal section can be threaded through an insulator and supported by trees.



**FIGURE 2
(THREE VERSIONS)**



Wire is a favorite material for antennas. It is easy to work with and makes assembly and disassembly of an antenna a quick process. A one-wavelength piece of wire can be used to construct a square loop antenna (above), a diamond loop (right) or a delta loop (below). The feedline attaches to the two points labeled F.



The Conet Project

Recordings of Shortwave Numbers Stations

Numbers Stations are found all over the shortwave spectrum. They emit unusual transmissions of synthesized voices reading sets of phonetic letters and/or numbers. The origin of these stations is in dispute. Their purpose is unclear. There are many dozens of different signal types on the air, each run by different organizations. Some of these organizations should have been closed down after the end of the cold war, yet they continue to transmit like clockwork. No one has ever compiled a set of Numbers Stations recordings for sale to the public. Until now.

The Conet Project: a quadruple CD covering 25 years of Numbers Station activity, with detailed logs, essays, and a definitive lookup table of all known Numbers Stations, including Morse Numbers Stations. An invaluable and fascinating resource for all listeners, this is the definitive reference work on the mysterious field of Numbers Stations, containing very rare recordings from as early as 1971 and up to date examples of currently operating stations. This is a limited edition release.

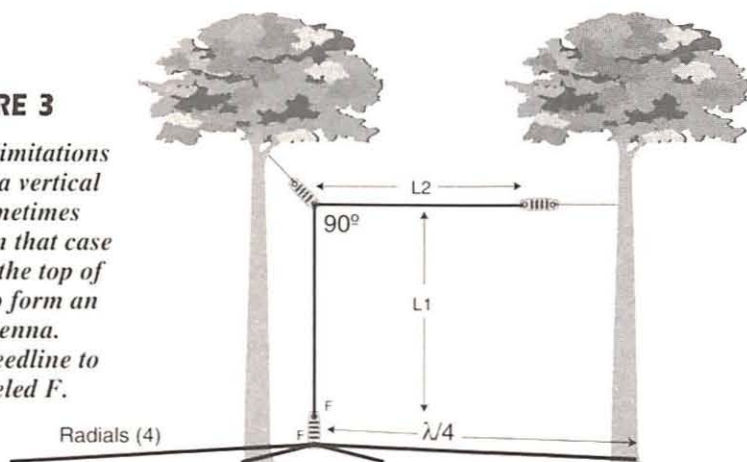
Catalogue Number: 59rd tcp1
 rdial@rdialsys.wmuk.net | rdial-discs@uk.fax: 44-171-351-5858
<http://www.bmpcug.co.uk/~rdial/conet.htm>
 rdial-discs Address: Po Box 424, London SW3 5DY

Mail Order: THESE Records, 112 Brook Drive, London SE11 4TQ UK
 Telephone: 44-171-587-5349 Facsimile: 44-171-582-5278
 The Quadruple CD costs: £27.50. VISA MASTERCARD and ACCESS accepted. EUROPEAN AIR MAIL: + £2.00 postage & packing UK & Surface mail ANYWHERE: + £1.50 postage & packing. USA AIR MAIL: + £3.00 postage & packing. ZONE 2 AIR MAIL (JAPAN AUSTRALIA etc.): + £3.75 postage & packing.

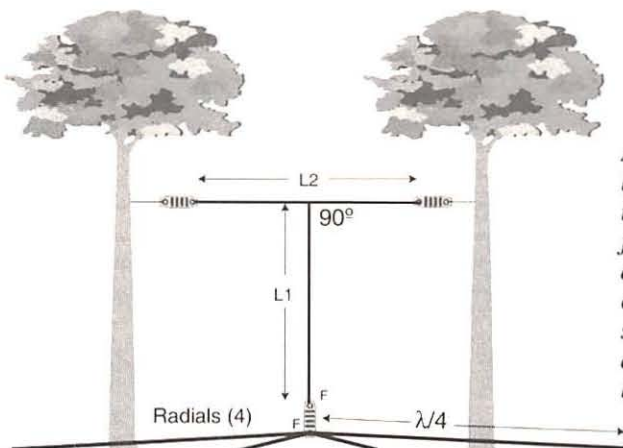
Distributed in the UK by PHD: Unit 15, Bushell Business Estate, Hithercroft, Wallingford, Oxon OX10 9DD
 Telephone: 44-1491-825-029 Facsimile: 44-1491-826-320

FIGURE 3

Due to space limitations or frequency, a vertical antenna is sometimes impractical. In that case you can bend the top of the antenna to form an inverted L antenna. Connect the feedline to the points labeled F.

**FIGURE 4**

Although it uses the same length of wire as an inverted L antenna, the flat-top T antenna may be a more convenient configuration in some settings. The feedline attaches to the two points labeled F.



Generally, the longer the vertical section, the better the antenna performance. We used this antenna on the 41-meter band.

FLAT-TOP T

A modification of the inverted L, the flat-top T antenna, also uses a quarter-wavelength of wire. In the flat-top T, however, the horizontal leg is centered on the vertical leg. See Figure 4.

As with the inverted L, the longer the vertical leg, the better the antenna performance. This design was used on the 31-meter band.

PHASED VERTICALS

If you want to use a vertical antenna, but don't need (or want) to hear signals from every direction, you can use two quarter-wave vertical antennas. Depending on how far apart the antennas are and how long the coax cable is that joins them, you can produce an antenna array that receives better in some directions than in other directions.

Figure 5 shows one such array. You can use Equation (1) to calculate the length of the antenna and the radials. By using

quarter-wavelength spacing between the two vertical antennas, you can also calculate that distance using Equation (1).

To produce an antenna that receives best in one general direction, the two vertical antennas need to be connected together using a specific length of coax. This version uses a length equal to $5\lambda/4$. You'll need to use Equation #3 to calculate the length of the coax

Phased vertical antennas can provide a variety of reception patterns. Among them are the figure 8 pattern, the three-leaf and four-leaf rose patterns and the cardioid pattern produced by the configuration shown here. A single vertical antenna will receive signals from any compass direction while the two phased vertical antennas shown here receive signals best from the direction of Antenna 2 toward Antenna 1.

phasing line. (This equation takes into account the velocity factor of solid polyethylene coax.)

$$P = 247500/f \quad (3)$$

where P is the length of the phasing line in meters, and f is the frequency in kHz. (For DXers who prefer to think in feet, use $P = 812008/f$.)

If you want to listen on the 13-meter band, the antenna and each radial length is 3.46 meters as calculated earlier for the quarter-wave vertical antenna. The spacing between the two antennas is also 3.46 meters. The length (P) of the phasing line L1 is $247500/21650$ or 11.43 meters. (By using a different feedline configuration, you can reduce the overall length of the phasing line. Refer to antenna manuals for suggestions.)

This antenna array receives best in the direction from Antenna 2 toward Antenna 1.

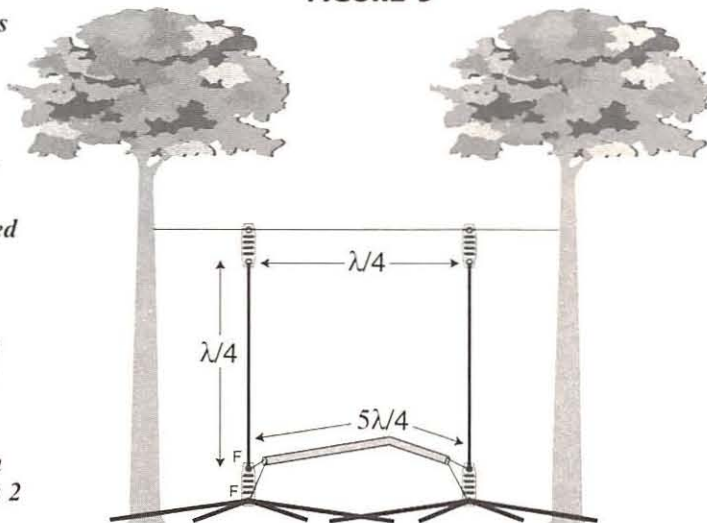
For use on the 22-meter band, the length of the verticals is a bit long, so I have to admit to resorting to using a pair of modified trap verticals designed for the 20-meter ham band.

It's worth noting that while each of these antennas was designed for use on a specific shortwave band, they pull in signals on many bands—they simply perform better near the design frequency.

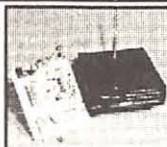
Go Fly a Kite

And for something a little out of the ordinary, try John Grimley's approach. At one of the camps, John attached his antenna (a random-length wire) to a kite and sent it aloft.

Whether you experiment with antennas or just enjoy the noise-free conditions in a rural setting, organizing a DX camp will add to everyone's enjoyment of the radio hobby.

FIGURE 5

Synthesized FM Stereo Transmitter



Microprocessor controlled for easy freq programming using DIP switches, no drift, your signal is rock solid all the time - just like the commercial stations. Audio quality is excellent, connect to the line output of any CD player, tape deck or mixer and you're on-the-air. Foreign buyers will appreciate the high power output capability of the FM-25; many Caribbean folks use a single FM-25 to cover the whole island! New, improved, clean and hum-free runs on either 12 VDC or 120 VAC. Kit comes complete with case set, whip antenna, 120 VAC power adapter - easy one evening assembly.

FM-25, Synthesized FM Stereo Transmitter Kit. \$129.95



Tunable FM Stereo Transmitter

A lower cost alternative to our high performance transmitters. Offers great value, tunable over the 88-108 MHz FM broadcast band, plenty of power and our manual goes into great detail outlining aspects of antennas, transmitting range and the FCC rules and regulations. Connects to any cassette deck, CD player or mixer and you're on-the-air, you'll be amazed at the exceptional audio quality! Runs on internal 9V battery or external power from 5 to 15 VDC, or optional 120 VAC adapter. Add our matching case and whip antenna set for a nice finished look.

FM-10A, Tunable FM Stereo Transmitter Kit. \$34.95
CFM, Matching Case and Antenna Set. \$14.95

RF Power Booster Amplifier



Add some serious muscle to your signal, boost power up to 1 watt over a frequency range of 100 KHz to over 1000 MHz! Use as a lab amp for signal generators, plus many foreign users employ the LPA-1 to boost the power of their FM Stereo transmitters, providing radio service through an entire town. Power required: 12 to 15 volts DC at 250mA, gain of 38dB at 10 MHz, 10 dB at 1000 MHz. For a neat, professionally finished look, add the optional matching case set.

LPA-1, Power Booster Amplifier Kit. \$39.95
CLPA, Matching Case Set for LPA-1 Kit. \$14.95
LPA-1WT, Fully Wired LPA-1 with Case. \$99.95



Micro FM Wireless Mike

World's smallest FM transmitter. Size of a sugar cube! Uses SMT (Surface Mount Technology) devices and mini electret condenser microphone, even the battery is included. We give you two complete sets of SMT parts to allow for any errors or mishaps-build it carefully and you've got extra SMT parts to build another! Audio quality and pick-up is unbelievable, transmission range up to 300 feet, tunable to anywhere in standard FM band 88 to 108 MHz. 7/8" w x 3/8" h x 3/4" h.

FM-5 Micro FM Wireless Mike Kit. \$19.95

Crystal Controlled Wireless Mike



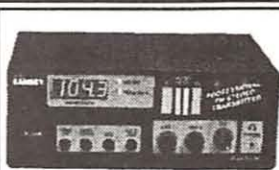
Super stable, drift free, not affected by temperature, metal or your body! Frequency is set by a crystal in the 2 meter Ham band of 146.535 MHz, easily picked up on any scanner radio or 2 meter rig. Changing the crystal to put frequency anywhere in the 140 to 160 MHz range-crystals cost only five or six dollars. Sensitive electret condenser mike picks up whispers anywhere in a room and transmit up to 1/4 mile. Powered by 3 volt Lithium or pair of watch batteries which are included. Uses the latest in SMT surface mount parts and we even include a few extras in case you sneeze and lose a part!

FM-6, Crystal Controlled FM Wireless Mike Kit. \$39.95
FM-6WT Fully Wired FM-6. \$69.95

Call for our Free Catalog!

RAMSEY

Super Pro FM Stereo Radio Transmitter



A truly professional frequency synthesized FM Stereo transmitter station in one easy to use, handsome cabinet. Most radio stations require a whole equipment rack to hold all the features

we've packed into the FM-100. Set frequency easily with the Up/Down freq buttons and the big LED digital display. Plus there's input low pass filtering that gives great sound no matter what the source (no more squeals or swishing sounds from cheap CD player inputs!) Peak limiters for maximum 'punch' in your audio - without over modulation, LED bargraph meters for easy setting of audio levels and a built-in mixer with mike and line level inputs. Churches, drive-ins, schools and colleges find the FM-100 to be the answer to their transmitting needs, you will too. No one offers all these features at this price! Kit includes sharp looking metal cabinet, whip antenna and 120 volt AC adapter. Also runs on 12 volts DC.

We also offer a high power export version of the FM-100 that's fully assembled with one watt of RF power, for miles of program coverage. The export version can only be shipped outside the USA, or within the US if accompanied by a signed statement that the unit will be exported.

FM-100, Professional FM Stereo Transmitter Kit. \$299.95
FM-100WT, Fully Wired High Power FM-100. \$429.95

Speech Descrambler Scrambler



Decode all that gibberish! This is the popular descrambler / scrambler that you've read about in all the Scanner and Electronic magazines. The technology used is known as speech inversion which is compatible with most cordless phones and many police department systems, hook it up to scanner speaker terminals and you're in business. Easily configured for any use: mike, line level and speaker output inputs are provided. Also communicate in total privacy over telephone or radio, full duplex operation - scramble and unscramble at the same time. Easy to build, all complex circuitry contained in new custom ASIC chip for clear, clean audio. Runs on 9 to 15VDC, RCA phono type jacks. Our matching case set adds a super nice professional look to your kit.

SS-70A, Speech Descrambler/Scrambler Kit. \$39.95
CSS, Custom Matching Case and Knob Set. \$14.95
SS-70AWT, Fully Wired SS-70A with Case. \$79.95
AC12-5, 12 Volt DC Wall Plug Adapter. \$9.95

Tone-Grabber Touch Tone Decoder / Reader



Dialled phone numbers, repeater codes, control codes, anywhere touch-tones are used, your TG-1 will decode and store any number it hears. A simple hook-up to any radio speaker or phone line is all that is required, and since the TG-1 uses a central office quality decoder and microprocessor, it will decode digits at virtually any speed! A 256 digit non-volatile memory stores numbers for 100 years - even with the power turned off, and an 8 digit LED display allows you to scroll through anywhere in memory. To make it easy to pick out numbers and codes, a dash is inserted between any group or set of numbers that were decoded more than 2 seconds apart. The TG-1 runs from any 7 to 15 volt DC power source and is both voltage regulated and crystal controlled for the ultimate in stability. For stand-alone use add our matching case set for a clean, professionally finished project. We have a TG-1 connected up here at the Ramsey factory on the FM radio. It's fun to see the phone numbers that are dialed on the morning radio show! Although the TG-1 requires less than an evening to assemble (and is fun to build, too!), we offer the TG-1 fully wired and tested in matching case for a special price.

TG-1, Tone Grabber Kit. \$99.95
CTG, Matching Case Set for TG-1 Kit. \$14.95
TG-1WT, Fully Wired Tone Grabber with Case. \$149.95
AC12-5, 12 Volt DC Wall Plug Adapter. \$9.95



Mini-Peeper Micro Video Camera

Super small, high quality fully assembled B & W CCD TV camera the size of an ice cube! Provides excellent pictures in low light (2 lux), or use our IR-1 Infra-Red light source to invisibly illuminate an entire room on a pitch black night! Imagine the possibilities... build it into a smoke detector, wall clock, lamp, book, radio. Exact same camera that's in big buck detective catalogues and stores. Kit includes: fully assembled CCD camera module, connectors, interface PC board kit with proper voltage regulation and filtering, hook-up details, even a mini microphone for sensitive sound! Two models available: Wide Angle Lens 3.6mm/1.5, adjustable focus lens, 92 degree view; Pinhole Lens 5.5mm/1.5, 60 degree view. The Pinhole Lens is physically much flatter and provides even greater depth of focus. The camera itself is 1.2" square. The Wide Angle Lens is about 1" long, Pinhole Lens about 1/2", interface PC board is 1" x 2" and uses RCA jacks for easy hook-up to VCRs, TVs or cable runs. Power required is 9 to 14 VDC @ 150 mA. Resolution: 380 x 350 lines. Instruction manual contains ideas on mounting and disguising the Mini-Peeper along with info on adding one of our TV Transmitter kits (such as the MTV-7 unit below) for wireless transmission!

MP-1, Wide Angle Lens CCD TV Camera Outfit. \$169.95
MP-1PH, Pin-Hole Lens CCD TV Camera Outfit. \$189.95

MicroStation Synthesized UHF TV Transmitter



Now you can be in the same league as James Bond. This transmitter is so small that it can fit into a pack of cigarettes - even including a CCD TV camera and battery! Model airplane enthusiasts put the MTV-7A into airplanes for a dynamite view from the cockpit, and the MTV-7A is the transmitter of choice for balloon launches. Transmitter features synthesized, crystal controlled operation for drift-free transmission of both audio and video on your choice of frequencies. Standard UHF TV Channel 52 (which should only be used outside of the USA to avoid violating FCC rules), and 439.25 MHz or 911.25 MHz which are in the amateur ham bands. The 439.25 MHz unit has the nifty advantage of being able to be received on a regular 'cable-ready' TV set tuned to Cable channel 68, or use our ATV-74 converter and receive it on regular TV channel 3. The 911.25 MHz unit is suited for applications where reception on a regular TV is not desired, an ATV-79 must be used for operation. The MTV-7A's output power is almost 100 mW, so transmitting range is pretty much line-of-sight which can mean many miles! The MTV-7A accepts standard black and white or color video and has its own, on-board, sensitive electret microphone. The MTV-7A is available in kit form or fully wired and tested. Since the latest in SMT (Surface Mount Technology) is used to provide for the smallest possible size, the kit version is recommended for experienced builders only. Runs on 12 VDC @ 150 mA and includes a regulated power source for a CCD camera.

MTV-7A, UHF TV Channel 52 Transmitter Kit. \$159.95
MTV-7AWT, Fully Wired Channel 52 Transmitter. \$249.95
MTV-7A4, 439.25 MHz TV Transmitter Kit. \$159.95
MTV-7A4WT, Fully Wired 439.25 MHz Transmitter. \$249.95
MTV-7A9, 911.25 MHz TV Transmitter Kit. \$179.95
MTV-7A9WT, Fully Wired 911.25 MHz Transmitter. \$269.95
ATV-74, 439.25 MHz Converter Kit. \$159.95
ATV-74WT, Fully Wired 439.25 MHz Converter. \$249.95
ATV-79, 911.25 MHz Converter Kit. \$179.95
ATV-79WT, Fully Wired 911.25 MHz Converter. \$269.95

RAMSEY ELECTRONICS, INC.
793 Canning Parkway
Victor, NY 14564

Order Toll-free: 1-800-446-2295
Sorry, no tech info or order status at this number

Technical Info, Order Status
Call Factory direct: (716) 924-4560



ORDERING INFO: Satisfaction Guaranteed. Examine for 10 days, if not pleased, return in original form for refund. Add \$4.95 for shipping, handling and insurance. Orders under \$20, add \$3.00. NY residents add 7% sales tax. Sorry, no CODs. Foreign orders, add 20% for surface mail or use credit card and specify shipping method.

The Under-\$30 Antenna Launch & Hoist

With this nifty antenna launch, you'll be the first to have your antenna high and in the clear at the next DX camp.



By Chuck DeLongfield KN6CF, AFA6FG

I've been sharing this idea with amateur radio friends for years and I have received many compliments on it. The antenna launch can be used to make your listening more enjoyable on camp-outs and picnics; it can be used to facilitate emergency communications by ham radio transmitters operating in difficult areas; or you can use it to get more altitude from your base station antenna.

The antenna hoist is used in conjunction with one of the 23 foot reel-type antennas such as those available from Radio Shack or Sangean. (Prices on these vary widely. I paid \$8.50 at Radio Shack; Grove Enterprises has the Sangean reel for \$14.95.)

This device enables you to easily extend your antenna to its full length *vertically*. This is accomplished by shooting a small lead weight over a tree branch, fastening your antenna, and reeling it up.

■ Assembly

Parts list: The weight is a Dipsy Swivel size 1/2. The fishing reel is a Zebco 202, approximately \$6. The slingshot is a folding Marksman, approximately \$8, available at Walmart or Kmart.

For assembly I used a 2-1/2 inch length of 1/2 inch outside diameter by 1/4 inch interior diameter fuel line and two 3/4 inch hose clamps. You should be able to get these items at any auto parts store; I got mine at Napa Auto Parts.

The wrist support slides right off the frame of the slingshot. Remove it and wet the hose to install; you can make it right or left handed, but install the hose clamps so that the screws face outward. Finally, slide the wrist support back on.

The Zebco reel is a fine product for the

price. It comes with plenty of 10 lb. test line already installed and works nicely right out of the bubble-pack. Although not necessary, I took the reel completely apart, mirror-polished the spool and reassembled it. They include full instructions and the only thing that they ignore is that Part #10, the anti-reverse pawl, must be reinstalled by putting the little tab into its rectangular slot with the flat side facing the gear (Part #7).

Should you ever need to replace the line, the assembly directions will come in handy, so hang onto them.

Launching

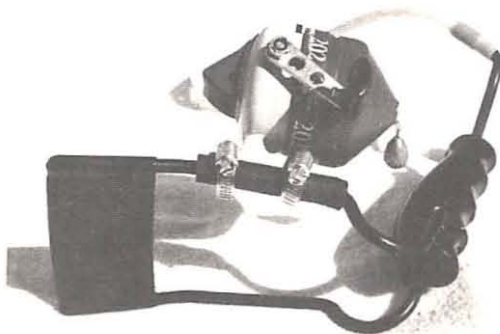
A few words of warning before you shoot—don't stand directly beneath the limb you are aiming at. Remember that the weight can ricochet. Also, make certain that there are no people, animals, or property that can come into your line-of-sight. *Do not aim this at or near power poles.* The launcher is very efficient. I have been able to reach several hundred feet with it. Fortunately, the installed reel does not prevent the slingshot from being used conventionally, so you can practice your aim all you want by plinking at tin cans, etc.

Your chosen branch should be clear and about 25 - 30 feet high. Be sure to release the thumb-stop before launching. After you have shot the weight over the desired branch and it has returned to the ground, turn the crank to lock the line. Fold and wrap a small slip-loop in the nylon antenna cord and hook it over the weight. After reeling the antenna up to the desired height, you can leave the launcher suspended just above your head for a counter-weight. When you're through using it, release the line, unhook the antenna and reel them both in.

If you are putting up a more permanent antenna, say, in your backyard, you will want to start with about twice the wire needed. After you have pulled the antenna wire completely over the branch, slip a couple of rubber bands over the long wire, then tie the loose end of the wire to the bands and gently pull the loop up to the branch. The rubber bands allow you to remove the antenna at a later date by pulling (with caution) rather than using a ladder.

Happy listening!

A slingshot, fishing reel, lead weight, and a reeled antenna are all you need for a go-anywhere vertical antenna. Rightmost photo shows how the reel attaches to the fuel line hose on the wrist support.



DMAT



MOBILE MEDICAL TEAM

By Patrick M. Griffith, NONNK
Communications Officer, DMAT CO-2

Disaster Medical Assistance Teams (DMAT) are an important part of the United States government's national emergency response network. Operating in a manner that is reminiscent of the legendary military M.A.S.H. units, DMAT's primary mission is to carry out Emergency Support Function #8 (health and medical services) of the *Federal Response Plan* by providing medical care and evacuation to victims of natural or man-made disasters.

DMATs have provided aid at many of the largest disasters in our nation in recent years, including hurricanes in Florida, Hawaii, and the Virgin Islands, the Northridge, California, earthquake, and the floods that ravaged the midwest. They also assisted at the bombing in Oklahoma City.

Though designed for response to federal disasters in the United States and its possessions, some of the 41 DMAT teams across the country can also be used in the "lean forward" standby mode for large scale events with the potential for many medical victims, such as for last summer's Olympic Games in Atlanta.

DMAT teams are organized under the National Disaster Medical System (NDMS) which is a nationwide medical mutual aid system established in joint cooperation with the Federal Emergency Management Agency (FEMA), the Department of Defense (DoD), the Veteran's Administration (VA), and the United States Public Health Service (USPHS). It is the USPHS that oversees the actual daily operation of the DMAT teams from their Office of Emergency Preparedness (OEP) in Rockville, Maryland.

Each team is typically comprised of 120 members. Many of these team members are medical professionals including physicians, dentists, nurses, paramedics, EMTs, respiratory therapists, pharmacy technicians, and more. The teams also include support personnel such as communications officers, logistics specialists, maintenance, security, and administrative personnel.

Team members hold full and part time positions outside of the DMAT team and serve on a voluntary basis until such time as they are activated for federal emergencies. When deployed on federal assignments, they are sworn in as compensated temporary employees of the USPHS. Deployments may last anywhere from a few days to a few weeks. Since teams are likely to be deployed into areas where the local infrastructure has been severely disrupted, each team member must carry enough supplies, including food and water, to be self-sufficient for at least three days.

Communications is a vital element in the operation of DMAT. When on deployment, teams must maintain communications links with their own team members, with local and state authorities in the disaster zone including local health care facilities, and with military authorities and other federal disaster relief agencies as well as with the team's home base and the NDMS national headquarters. The teams must also communicate with the USPHS Management Support Unit (MSU) which serves as the on scene command and control liaison between USPHS, DMAT, and the local community. These communications utilize a variety of methods including landline, cellular, and satellite telephone, VHF, and UHF, radio for short range communications, and high frequency (HF) radios for medium and long range communications.

Each team has developed its own communications system. Some are very elaborate, some are very basic, and some are in between. Table 1 is a list of UHF radio frequencies assigned to DMAT teams on a national basis. These frequencies are located in the govern-



CO-2 team member dons gear for toxic disaster readiness training.

ment "A" band. Most of these frequencies have shared use with other federal agencies, particularly FEMA, and may or may not be usable by DMAT in a specific geographic region.

DMAT teams are also authorized to operate on many of the federal HF networks including those of the Shared Resources high frequency radio program (SHARES) which is operated by the National Communications System

(NCS). The table lists some of the common HF frequencies that could be active with DMAT traffic in a disaster situation.

Many DMAT teams operate in other parts of the VHF and UHF bands as well, and may use business, itinerant, public safety, special emergency, medical service, and even GMRS frequencies. Teams also use amateur radio and most DMAT communications officers are licensed amateur radio operators. Since the purpose of DMAT is emergency medical service and disaster relief, and since these teams operate as an arm of the U.S. government, it is conceivable that they could show up on just about any frequency in an emergency situation.

Table 1

Frequently-used UHF channels (in MHz)
408.400 (1) 409.000
418.050 (1)(2) 418.075 (1)
418.575 (1) 419.600

(1) Shared use with FEMA Urban Search and Rescue (USAR) teams
(2) May be used as itinerant repeater output

Channels to check for HF activity
All freqs kHz, generally upper sideband
5211 5236 6809 9973 10493
10891 14396

Motron 310 Garfield St Suite 4
Eugene, Oregon 97402
PO Box 2748
<http://www.motron.com>



DTMF & ROTARY TEST DECODERS

TONE-MASTER™ TM-16A & TM-16A Plus

Decode and display DTMF from nearly any audio source; scanner, tape recorder, etc. And now decode and display either DTMF or Rotary digits from a telephone. **TM-16A PLUS** with RS-232 serial output includes Logger Software for optional automatic date/time/number logging using your IBM Compatible computer. Prices and specifications subject to change without notice.

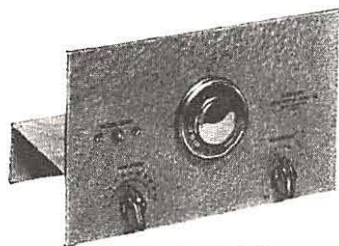
TM-16A DTMF & Rotary Decoder \$179.00 **TM-16A Plus** with RS-232 output \$249.00

S/H: \$8 USA, \$11 Canada, \$16 Foreign. Premium shipping available for an additional charge. Visa, MasterCard, Discover & American Express Accepted. COD on Cash or Money Order basis only: \$5.

Orders: (800) 338-9058 Info: (541) 687-2118 Fax: (541) 687-2492

Allied Radio
CORPORATION

FASCINATING, INSTRUCTIVE
USED BY MANY LEADING TRAINING SCHOOLS



knight-kit
"OCEAN HOPPER" RECEIVER KIT

Model S-740 BROADCAST, LONG WAVE &
SHORT WAVE RECEPTION

\$10⁷⁵

The famous "Ocean Hopper" receiver kit—sensationally low-priced—tops for enjoyable broadcast, long wave and short wave reception. Highly sensitive regenerative-type circuit. Excellent head-phone reception; can be used with 3-4 ohm PM speaker on strong broadcast band stations. Supplied with plug-in coil for standard broadcast; covers long wave and popular short wave bands with coils below. Pulls in thrilling foreign broadcasts, police, amateurs and aircraft. Controls: Main Tuning, Bandspeed, Antenna Tuning, Off-On-Regeneration. Handsome gray panel, logging type lucite main tuning knob. With all parts, tubes, instructions (less extra coils and headset). AC or DC operation. Shpg. wt., 5 lbs.

Model S-740. "Ocean Hopper" Receiver Kit. Net..... **\$10.75**

EXTRA PLUG-IN COILS

S-741. Long Wave, 155-470 kc. Net.....79c
S-742. Short Wave, 1.65-470 kc. Net.....79c
S-743. Short Wave, 2.9-7.3 mc. Net.....79c
S-744. Short Wave, 7-17.5 mc. Net.....79c
S-745. Short Wave, 15.5-35 mc. Net.....79c

Helping Hand for The Knight-Kit Ocean Hopper



By Al Cikas KA9GDL

Many radio enthusiasts began their hobby right here: with the whistling radio signals snared by the regenerative circuit of Knight's "Ocean Hopper." Now a collector's item, the little world band radio gets a safety update in this exclusive article.

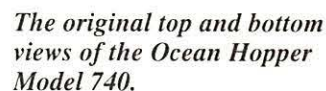
Whether or not you were around in the late 1950s or early 1960s to experience them, the Knight "Ocean Hopper" shortwave receivers remain some of the most enigmatic and revered commercial units ever devised. A recent resurgence of interest in these receivers has driven the "collector's value" to many times the original cost. The history of these little units seems rather bland, but many owners firmly believe the final chapter has yet to be written. And if you cannot find one of these receivers for sale, take heart; we'll tell you how to build one right here.

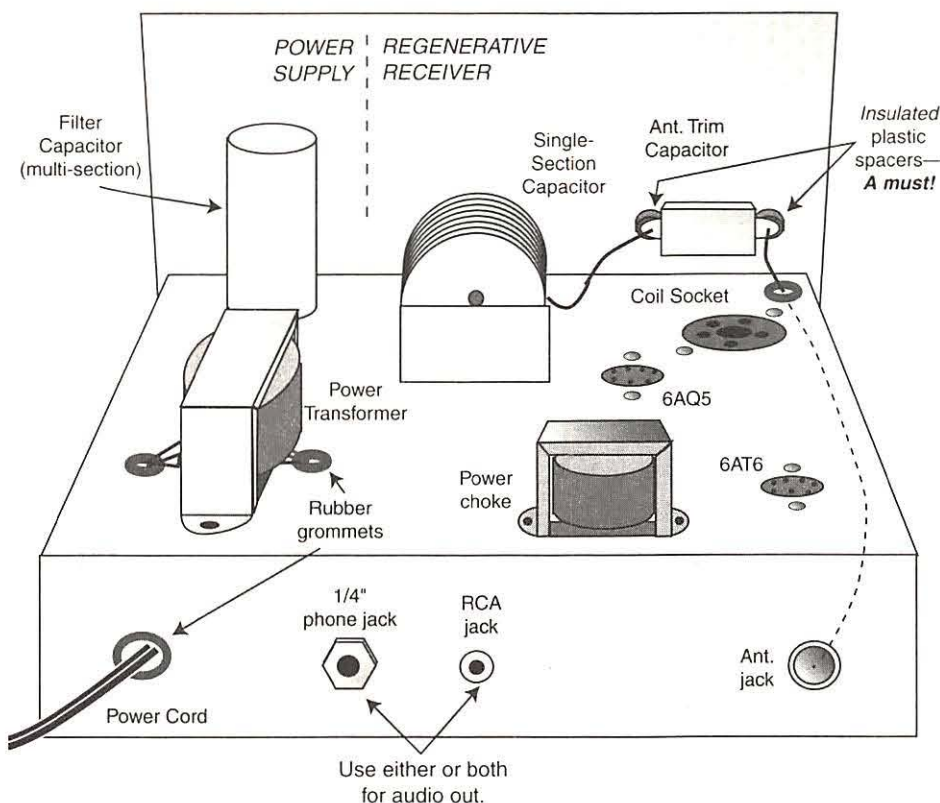
The original Ocean Hopper was a two-tube beginner's kit available for around eleven dollars some 40 years ago. It had to be the world's lowest-priced commercially available shortwave set. Many hams got their start with one of these. Even more hams, the author included, only wished they could have owned one. Despite, or because of the low price, some inherent dangers existed.

As you can see, 12 and 50 and 35 volt filaments only add to 97 volts dropped by the circuit. The remainder of the 110 VAC household voltage was dropped by a 200 ohm resistor, which in effect just wasted power. In those days the recommendation was to power the receiver through an isolation transformer, but few owners bothered.

The 50C5, however, turned out to be a problem. No low-filament-voltage versions of the tube existed, so the audio stage had to be

The original Ocean Hopper used a set of plug-in coil forms to accomplish band changing. The absence of a volume control was





most notable. Audio output was available to either a 2000 ohm high-impedance headset or a 4 ohm speaker. Sad to say, Ocean Hoppers do not power a speaker very well.

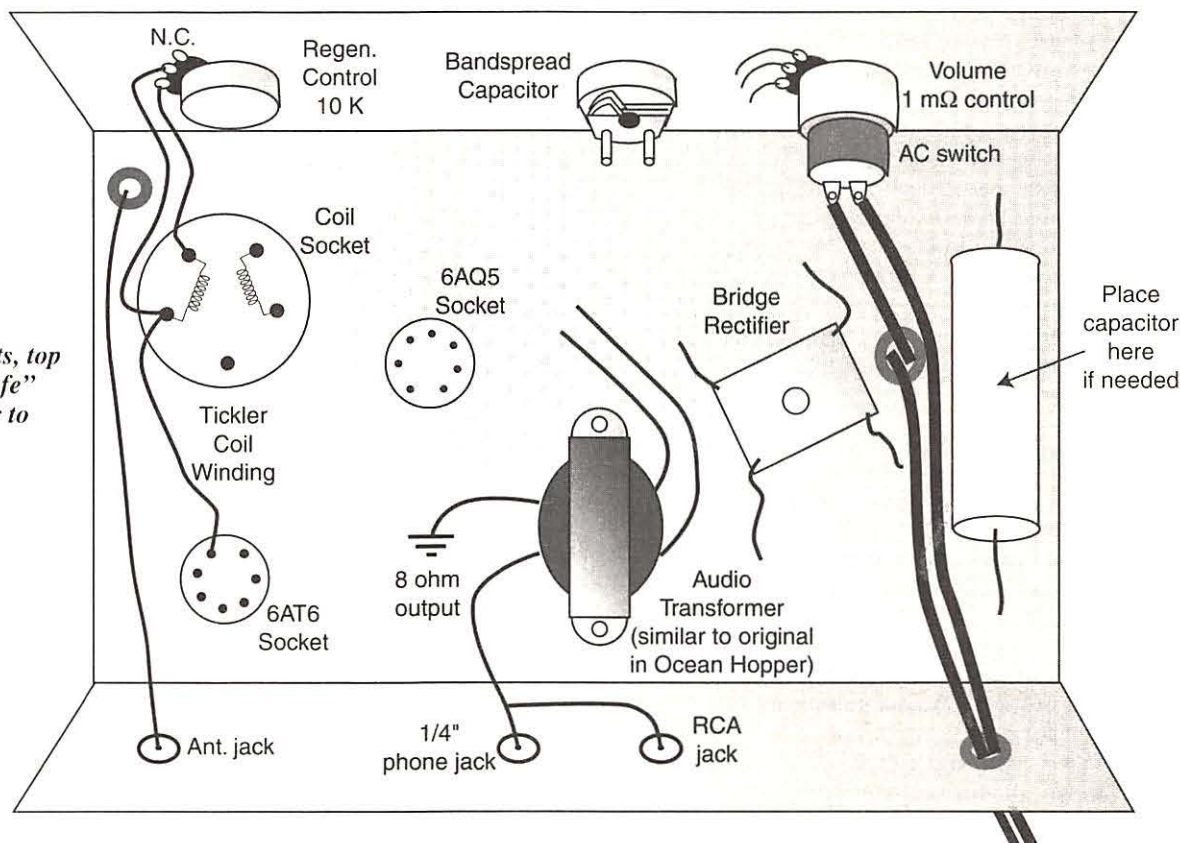
The Ocean Hopper regenerative circuit had another unique characteristic. The regenerative "tickler" winding was placed in the plate B+ high voltage circuit. This results in a superb regenerative detector circuit, when compared with the tuned "grid circuits" used in almost every other regenerative receiver. This means you should *never* change coils while the power is on. Ditto for the author's circuit.

One unique aspect of the Knight Ocean Hopper was the tuned frequency circuit. The tuning coil was placed across three separate tuning capacitors. The smallest was the band spread or fine-tuning capacitor. The other capacitors comprised two sections of a ganged circuit, only the smaller of which was used to tune the shortwave bands. The larger, or third, capacitor was tied to the final pin on the coil socket, and was connected by an internal jumper within the Broadcast Band and Longwave coils. (It is suggested that you not try to wind either of these yourself.)

The point of all of this is that you can use a single-section capacitor, as the author did, for the main tuning capacitance. This will simplify your needs. If you have a two-sec-

FIGURE 2

Recommended layouts, top and bottom, for a "safe" Ocean Hopper. Refer to text for precise descriptions.



DRAKE PUTS THE WHOLE WORLD IN YOUR HANDS...



WITH THE SW2 SHORTWAVE RECEIVER.

Drake puts the whole world in your hands with the SW2 Shortwave Receiver. Tune in AM broadcast, amateur, CB or shortwave bands with continuous coverage from 100 kHz to 30,000 kHz. Single sideband operation and AM selectable sideband synchronous detection, brings the world closer to you. And with the optional infrared remote control, the world is in your hands even when the receiver is out of reach.

To find out how to get your hands on the world, call Drake at 1-800-937-2530.



230 Industrial Dr. Franklin, Ohio 45005
phone: 513-746-4556 fax: 513-743-4510
on-line: <http://www.rldrake.com>



COIL FORM

Wind both coils in same direction

Minimum 4 pins if plug-in form is used with a socket



Coil pin # Go To

- | | |
|---|--|
| 1 | B+ |
| 2 | Ground |
| 3 | Ant. Tuning |
| 4 | N/C (extra capacitor section, if used) |
| 5 | Plate of 6ATC |
- 2 and 3 are tuning windings, 10-40 turns
- 1 and 5 are the regen. "tickler" windings, 3 or 4 turns \pm 1/2 turn
- 4 jumpers to 3 in original BCB and LW coils

lettering available through office supply stores. The chassis was taken from a defunct Heathkit "Lunch Box" style capacitance checker, and measures five inches deep. Parts placement is a bit tight. The author's recommendation for major parts location is shown in the drawings. The unit is extremely flexible, so any workable arrangement is OK. Since the tube filaments are now wired in parallel with the filament secondary, it is also possible to add a pilot lamp, if desired.

■ Operating, fine-tuning, and experimenting

Operating an Ocean Hopper is pretty easy. If you build the circuit with care, it operates immediately. There is no "alignment procedure" to follow. This makes it attractive to both the first-time builder, as well as the old-timer who perhaps wants to tinker with an easy project, perhaps to build as a loaner for a prospective new SWL.

The tuning process is a fine balance between adjustment of the antenna trimmer, the regen pot, and the band spread controls. The antenna trimmer is a "set and forget" affair. Adjustment is made with a small screwdriver in both the original Ocean Hopper and in the author's version. The antenna trimmer is tuned for max and only needs readjustment if you change coils or move to the main tuning capacitor between opposite ends of its range.

The regenerative control is delicate and mastery of the regen knob only comes with practice. Set the main tuning capacitor to a region that seems active and use the band spread capacitor to fine-tune the signal. Once the controls are balanced, you will enjoy hours of listening. As a bonus, the Ocean Hopper circuit can even process the stronger CW and SSB signals on the amateur bands.

Reprints of manuals for the original Ocean Hopper are available from Hi-Manuals, PO Box 802, Council Bluffs, Iowa 51502. Parts are where you find them.

Virtually any capacitor values can be used for the tuning circuits. Your first shortwave coil can be wound from #20 wire on a 1-inch or 1-1/4-inch form. Use 4 turns for the tickler winding and 9 and 10 turns for the tune wind-

ing. This will place you in approximately the 5 - 10 MHz portion of the shortwave spectrum. If plug-in coils forms and a socket are available, you can experiment with winding other coils for wider coverage. Use more turns of thin wire (#24, etc.) Or fewer turns of thicker wire (#18, etc.). With practice, you will easily be able to cover 3 to 12 MHz, or maybe more.

The turns count should be 4 to 10 turns for the "tickler" winding and 9 to 43 turns for the "tune" winding. For higher frequencies, fewer than 9 turns may be tried, but only the very strongest of signals will be received. Be sure to wind both coils in the same direction.

The author and *Monitoring Times* would appreciate hearing from any readers with interesting "Ocean Hopper" stories. The author's upgraded circuit is easy to build and fun to enjoy. Happy listening!

HEAR in the CLEAR

SGC's new **PowerClear™** uses the power of advanced **Digital Signal Processing** to clear noisy, interference-plagued audio.

Reduce noise and interference from virtually any audio source—HF, VHF/ UHF transceivers, scanners, shortwave receivers, micro-wave, and telephone lines.



PowerClear stands 3.65" high

PowerClear attacks noise and heterodynes with advanced DSP algorithms and lets you tailor bandpass response to your individual need—separate adjustments for low and high cutoff as well as audio bandpass shift.

Cut through the noise with factory preset filters and with up to seven combinations of your choice. The bright red and green LEDs quickly show your selected filter adjustments.

Hear more with SGC's PowerClear. Call your SGC dealer now for details.

*No Compromise
Communications*

SGC



SGC Inc., SGC Building, 13737 S.E. 26th St. Bellevue, WA. 98005 USA
P.O. Box 3526, 98009 Fax: 206-746-6384 or 746-7173 Tel: 206-746-6310 or
1-800-259-7331 E-mail: SGCMTG@aol.com World Wide Web: sgeworld.com

Pick a Pock of Packets

The Internet has popularized the idea of the packet switched network. Instead of using a dedicated, direct connection between the source and the destination to move information, like a telephone call uses, a packet switched network moves chunks of information (packets) from one point in the network to another, allowing the communications channel to be shared among a number of users.

This month we'll take a look at three companies offering wireless packet data communication service, each of which allows mobile users to access and send information anytime from (almost) anywhere. A typical subscriber has custom software running on a laptop, notebook, or palmtop computer that is connected to a wireless modem. The most common application at this point in time seems to be electronic mail, although inventory management, sales and marketing information, and even web browsing are becoming popular.

Before cellular carriers began to market data communication solutions (see the March 1997 *PCS Front Line*), two major wireless providers were offering nationwide radio data communications service. Both services are similar in a number of ways, and offer the following features:

- Transparent nationwide roaming, allowing a user to travel from city to city and be able to use the service without a complicated registration process.
- Store and forward capability, holding messages in the network until the recipient is available.
- Group messaging, allowing a single message to be "broadcast" to a number of subscribers at once.
- Robust error detection and correction, identifying and fixing packets that may have been corrupted during transmission.
- Per use charges. Instead of paying by the minute, customers pay according to the amount of data they transfer, typically measured by the kilobyte (about a thousand characters).

■ ARDIS

Advanced Radio Data Information Services (ARDIS) started out in 1990 as a joint venture between IBM and Motorola, primarily to serve IBM field technicians. A few years later Motorola bought IBM's 50% share for about \$35 million. A network operations center (NOC) is maintained in Lexington, Kentucky, with a backup near Chicago, Illinois.

ARDIS claims to serve more than 44,000 customers in at least 400 of the top U.S. metropolitan areas. That figure includes many large corporations, and makes it the largest installed base of mobile data network users in the United States. ARDIS supports sending and receiving wireless messages from the

Internet, corporate and personal computer systems, and other ARDIS subscribers.

Every ARDIS service area supports, at a minimum, data rates of 4800 bits per second (bps) using a Motorola transmission protocol called MDC-4800. In a handful of major metropolitan areas another proprietary Motorola protocol, RD-LAP, is used to support speeds of up to 19,200 bps. Regardless of speed, each protocol makes use of error detection and correction information sent along with the data, as well as allowing badly garbled packets to be retransmitted. A single packet can hold up to 240 characters, although the average is about half that size.

More than 1300 base stations provide service to ARDIS users, transmitting at an average power of 45 watts. Mobile units transmit using three to four watts of power, and all radio communication takes place in the 800 MHz Specialized Mobile Radio (SMR) band.

The most recent pricing information I have shows a "DataPak 20," the least expensive plan, at \$19.95 a month for 20 kilobytes of data.

■ RAM Mobile Data

RAM Mobile Data is the second largest wireless data communications provider in the United States. Founded in 1989 by RAM Broadcasting Corporation, BellSouth spent more than \$300 million to buy 49% of the company in 1989. RAM Mobile maintains a Network Control Center (NCC) at their corporate headquarters in New Jersey, and a backup NCC in Dallas, Texas.

RAM Mobile Data claims to serve at least 40,000 customers in more than 260 of the 316 metropolitan statistical areas (MSAs) in the United States. This service area represents more than 90% of their desired customer base, the urban business population. In each MSA, no fewer than 10, and as many as 30 radio frequency pairs are available at numerous base stations with overlapping coverage areas.

RAM Mobile Data uses an open, non-proprietary protocol called Mobitex, which is used in at least 16 other countries for two-way wireless data communications. Mobitex follows the Open System Interconnection (OSI) model, and supports wireless Internet Protocol (IP) connectivity.

Like ARDIS, RAM Mobile Data uses frequencies in the Specialized Mobile Radio band. The mobile units transmit between 896 MHz

ARDIS	RAM Mobile Data	Metricom	Ricochet
Coverage	nationwide	nationwide	selected areas
Data rate (in bits per second)	4800 (19,200 in ltd. areas)	8,000	typically about 28,800
Packet size (in bytes)	240	512	500
Mobile transmit power (watts)	3	2 to 100	.6
Response time (seconds)	2 to 7	4 to 8	1 to 3
Transmit Frequencies (in MHz)	800 (SMR band)	Mobile: 896 to 901 Base: 935 to 941	902 to 928
Channels	600	200	162
Channel spacing	25 kHz	12 kHz	160 kHz
Pricing (representative)	\$20 / 20 kilobytes	\$30 / 100 kilobytes	\$30 / unlimited

and 901 MHz, and the base stations transmit 39 MHz higher, between 935 MHz and 940 MHz. Data is transmitted at 8,000 bits per second (bps) and uses automatic repeat and forward error correction to combat noise and fading typical in a mobile radio environment.

Messages may be sent to an individual mobile unit or to a group. If a subscriber is not reachable because the modem is turned off or the unit is out of a coverage area, the message may be stored in the network for up to 72 hours. When the modem is turned on or re-enters a coverage area, stored messages are automatically delivered. As an option, the sender can receive a confirmation notice when the original message is delivered to the recipient.

Mobile units stay in contact with the radio network through the roaming capabilities of the system, in many ways similar to a cellular telephone network. Mobile units monitor signal strength from nearby base stations and determine if and when a transfer to another base station is necessary.

Modems are available from major equipment suppliers such as Ericsson, GE, and Motorola. Pricing starts at \$25 per month for up to 100 kilobytes worth of messages, with each additional kilobyte costing 35 cents.

RAM Mobile Data claims the security is high on their system, and provides several mechanisms to discourage eavesdroppers. First, the mobile radio unit determines the frequency to use, and can hop through each frequency supported in the service area. As the mobile unit travels, it will inform the closest base station of the channel on which data will be communicated. Since packets from different modems will all be sent on the same radio channel, and each modem only uses the channel for short intervals, RAM Mobile believes that this interleaving of packets "discourages the isolation of messages within RAM's network" and makes the eavesdropper's task more difficult.

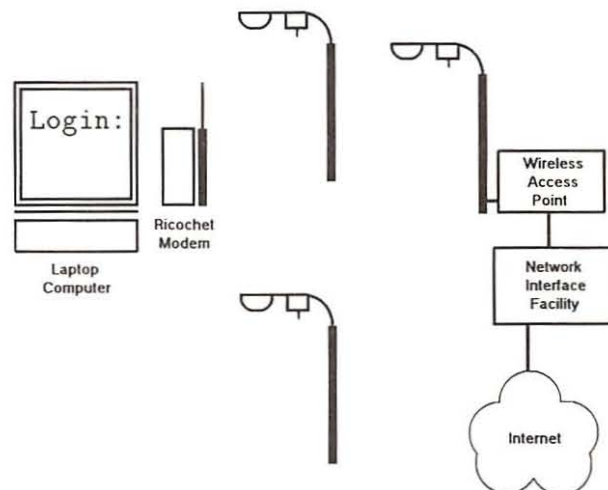
Second, each terminal in the network contains an electronic serial number (ESN) and is assigned a mobile access number (MAN). When a unit attempts to access the network the ESN and the MAN must match. If they don't, or if fraud is suspected, the Mobitex network has the capability of remotely disabling the modem. In addition, users may also have a password-protected subscription that can be accessed from any terminal.

■ Metricom

One of the winners in the recent Wireless Communications Service (WCS) was Metricom, Inc. (for more information on the auction, see the July 1997 *PCS Front Line* column). New spectrum in the 2.3 GHz range will help them expand an innovative service they currently offer in a few cities, university campuses, and airports across the country.

The Ricochet data network provides wireless access to the Internet and other data applications at speeds approaching 28,800 bits per second at an affordable price. For a flat monthly charge of about \$30, customers can move unlimited amounts of data using a 600 milliwatt paperback book-sized modem attached to the back of a personal computer. Many world wide web addicts have subscribed to Ricochet instead of ordering a second telephone line. As Metricom admits, "Our competitor is the wireline modem."

Ricochet transmits information in the unlicensed 902 to 928 MHz band with a technique called frequency hopping spread spectrum (FHSS). The 26 MHz of bandwidth is divided into 162 channels, each 160 kHz wide. A Ricochet modem selects a sequence of 55 channels and "hops" from channel to channel, spending only about 100 milliseconds on any one channel before moving to the next one in the



If Ricochet is available in your area and you like to surf the web, this is the way to go.

list. The sequence may gradually change as channels with high interference levels are dropped and replaced with new channels, causing the connection quality to improve over time. This technique also allows many users to share the spectrum without interfering with each other, and makes eavesdropping rather difficult.

Packets average 500 bytes in size, and are transmitted to and from one watt transceivers mounted on nearby lightpoles. Rather than building a tower and installing large, expensive, and complicated equipment, Metricom contracts with a local utility to mount a small rectangular box on a lightpole or similar structure, spacing them a quarter to half a mile apart. Each "pole unit" receives packets from local modems, adds an identifier and forwards it to either another pole unit or a wireless access point (WAP), where it is placed on a leased line and sent to a network interconnection point, eventually reaching the Internet.

At the end of 1996 Metricom had more than 9,000 Ricochet customers, but as great as it is, the service has one major drawback — availability. Metricom has networks in Seattle, San Francisco, and most recently Washington, D.C., as well as a dozen or so colleges and corporate campuses. If it's available in your area and you like to surf the web, this is the way to go.

There's more information on these services at the PCS Front Line website at <http://www.grove.net/~dan>, and I can be reached by electronic mail at dan@decode.com. Until next month, happy monitoring!



Get Global E-Mail and GPS in One Handheld Unit!

The Magellan GSC-100 allows you to communicate anywhere, anytime, via the powerful ORBCOMM satellite network, providing true global e-mail coverage. Only \$999.95!

Now available from Grove Enterprises. For more information about this and other advanced technologies, visit our website at www.grove.net or see our Buyer's Guide in this issue of MT.

Richard Barnett
ScanMaster@aol.com

The TrunkTracker Debuts!

This is our first article since the debut of the Uniden BC-235XLT Trunk Tracker and what a debut it was! The final numbers aren't in yet, but the 235 appears to be the hottest scanner introduction since at least the Bearcat 250, if not the 210. (The BearTrackers 10 and 12 had even a larger initial "sell-in," but those products have more of a general motorist/trucker appeal, as opposed to hobbyist and professional interest.) We're basing this "hot" introduction on a number of factors:

1. Pre-debut hype about the product.
2. The manner in which the outlook of both the hobbyists and the industry has done almost a complete 180° with the 235's debut, from doom-and-gloom to guarded optimism.
3. The number of units pre-sold by dealers and distributors.
4. The inability to fill the pipeline as a result of those orders.
5. Excitement over the product by those who have purchased the unit.
6. The explosion of interest and discussion about the product on-line, from AOL's World of Radio hobbyist area, to CompuServe Hamnet, Usenet, SCAN-L, and dozens of local web pages devoted to regional scanning. Everyone is trading IDs and discussing the 235's operational characteristics. A new list server, dedicated solely to the TrunkTracker and trunked radio communications, has been inaugurated by Grove. (More about "Trunkcom" later.)

Sales of the BC-235 have been tremendous. As Uniden's executive vice president of sales stated in mid-June, "The BC-235 is currently in full production and we are shipping the units as quickly as we can get them into our warehouse. The demand for the product has been so great, we suspect dealers and distributors are running out of stock almost as quickly as they receive the units. We are working to fill orders as quickly as possible."

What's the reason for the demand? As Mike Heightchew, an active member of BASE, the (San Francisco) Bay Area Scanner Enthusiasts club, said, "Even besides the incredible TrunkTracker feature, this radio (the 235) is a great scanner....it's not susceptible to intermod, and the sensitivity is excellent! Uniden has put the fun back into scanning and has saved the hobby!" Mike already owns two 235's.

Mike also reported that the system he listens to, the Alameda County (ALCO) trunked system, can no longer be monitored by some of the other agencies which border the county. One battalion chief in a neighboring department had wanted to monitor ALCO for some



time to be aware of potential mutual aid fires. But, with the trunked system, he had been shut out. As soon as the BC-235 hit the market, his county purchased a TrunkTracker for him and now he's considering buying more for his department.

This is only one of numerous examples we've heard of law enforcement, fire service, and emergency management entities buying and prizing their new Bearcat scanners. Best of all, it shows how scanners can provide a cost-effective answer to a very difficult and important public safety problem.

Another example of the TrunkTracker offering a valuable, and atypical, service, was told to us by a friend in the Dallas area. He was showing his new BC-235 to his next-door neighbor, who is a policeman in his town. The neighbor was impressed, as their town operates on a small trunking system and he was familiar with the complex technology. Best of all, this officer called his wife out of their house and showed her the radio. She instantly

lit up with a smile.

It turns out that they had moved to Texas from Chicago, where the wife could easily monitor her husband's radio calls on the Windy City's conventional UHF radio system. Now, though the city was smaller, the trunking system meant she was unable to keep track of her husband on his dangerous job. She wanted to know, right then and there, where she could purchase a TrunkTracker. She was going to feel much better being able to monitor her husband's radio calls and knowing he was safe.

As someone who was involved in the development of this project, these are the stories we love to hear. If you have any stories about the TrunkTracker, please pass them on via e-mail to Scanmaster@aol.com or by mail to me, care of the *Monitoring Times* mailing address.

■ TRUNKCOM: The all-new mailing list for trunking radio data

The Trunkcom mailing list server was suggested in June of '97 by Larry Van Horn, *MT*'s assistant editor, and developed and maintained with the help of the Grove staff by myself (Rich Barnett), Greg Knox, and John McColman. The mailing list server permits the exchange of information between its subscribers, radio hobbyists, and professionals interested in monitoring trunked radio communications. Trunkcom provides its subscribers with a forum for the free exchange of information by reflecting e-mail messages sent to the list.

The Trunkcom mailing list is a non-membership group open to all

subscribers with a genuine interest in the hobby of monitoring trunk radio communications, and as such does not require dues. This list is provided as a public service to the radio hobby community free of charge by Grove Enterprises (publisher of *Monitoring Times* and *Satellite Times* magazines) in Brasstown, North Carolina, and is owned and managed by the Trunkcom staff.

Information posted on the list may be reposted with credit on the World Wide Web site www.trunktracker.com, which is a clearing-house of trunking-related data and Trunktracker questions and answers, tips, techniques, and more.

■ Subscription Information

1. To subscribe to the Trunkcom mailing list, send an e-mail message (no subject required) to "majordomo@grove.net" with the following command in the body of the message:
subscribe Trunkcom <your e-mail address>
Substitute your e-mail address where indicated in the line above.
2. If you would like to receive a digest of the messages posted to Trunkcom rather than each individual message, you should subscribe to the Trunkcom digest service. Send a message to majordomo@grove.net (no subject line or signature block). In the body of the text type:
subscribe Trunkcom-digest <your e-mail address>

■ Posting to the Trunkcom List

To send a message to the list, send e-mail to: trunkcom@grove.net
No anonymous posts are allowed on the Trunkcom list. All posters are required to sign at least their first name to each post to the list. Prior to your first post we encourage new subscribers to read the mail for a few days to become familiar with the current traffic being passed on the list. We also highly encourage new subscribers of the list to introduce themselves in their first post. You might wish to include some information about yourself, your equipment, and the type of agencies you monitor. We find that intros foster new friendships and facilitate the exchange of information among subscribers of our list.

Once you subscribe to Trunkcom, you will be presented with further details on the list, including rules of conduct. We hope that you will consider signing up and contributing to Trunkcom. For those interested in federal communications, may we suggest the Fedcom list; for military, try Milcom. Both these lists have the same subscription parameters for signing up; just replace Trunkcom with either Fedcom or Milcom.

For those interested in more general scanner topics, try Scan-L, an excellent resource hosted by Peter Laws. To subscribe to Scan-L, send a message to LISTSERV@UAFSYSB.UARK.EDU with the command "subscribe SCAN-L Your Name" in the body.

Now, back to Trunkcom, here's a June posting to Trunkcom to give you a flavor of what to expect on the mailing list:

Hi Ya'll - this is all the information I have collected for the San Antonio and Bexar County. This is a VERY long posting, but I promise the data is accurate. This information has also been sent to www.trunktracker.com.

If you have any questions please feel free to Email me. Enjoy.
Wayne (waynef@texas.net)



The Alamo in San Antonio

City: San Antonio

System: 20 Chan Type I
Name: System 1
Location: Tower of Americas
Fleet Map: S-13, S-12, S-12
Freqs: 856-860 2625, 4625, 7625, 9625
Talk Group Designators 000=Police Patrol 400=Fire/EMS 600=CID/Park Rangers

Talk Groups

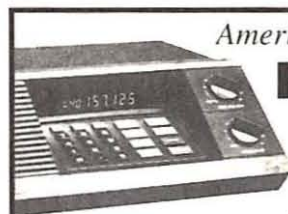
Police Patrol	Patrol Units	Chan Name
000-1 North Patrol	31xx,32xx,33xx	1 ALPHA
000-3 West Patrol	51xx,52xx,53xx	1 CHARLIE
000-5 South Patrol	61xx,62xx	1 ECHO
000-6 East Patrol	41xx,42xx	1 FOXTROT
000-7 Central Patrol	21xx,22xx,23xx,24xx,25xx	1 GULF
000-8 Traffic Patrol	11xx,through 18xx	1 HOTEL
000-9 Information	Various	1 INDIA

Police Patrol Open Channels

000-2	1 BRAVO	000-12	1 LIMA
000-4	1 DELTA	000-13	1 MARY
000-10	1 JULIET	000-14	1 NOVEMBER
000-11	1 KILO	000-15	1 OSCAR

Police Central Intelligence Division

600-1	4 ALPHA Open Ch	600-8	4 HOTEL Open Ch
600-2	4 BRAVO Auto Theft	600-9	4 INDIA Open Ch
600-3	4 CHARLIE Open Ch	600-10	4 JULIET Vice
600-4	4 DELTA Detectives	600-11	4 KILO Police Academy
600-5	4 ECHO Rope	600-12	4 LIMA Open Ch
600-6	4 FOXTROT Open Ch	600-13	4 Mary Open Ch
600-7	4 GULF Gang		



America's #1 Scanning Magazine is

National Scanning Report

But don't take our word for it. Check it out yourself. \$3.00 cash will get you a sample copy rushed to you by First Class Mail. Or subscribe for just \$19.90 and you'll get a free custom frequency print-out for your county.

1-800-423-1331

P.O. Box 360,
Wagontown, PA
19376

Park Rangers

600-14 Park Rangers 93xx

Fire/EMS Department

400-1 Fire Dispatch	1 ALPHA (CPS Patch)	400-9 Arson Unit	1 INDIA
400-2 Fireground	1 BRAVO	400-10 Fireground	1 JULIET
400-3 Fireground	1 CHARLIE	400-11 Fireground	1 KILO
400-4 Fireground	1 DELTA	400-12 Fireground	1 LIMA
400-5 Fireground	1 ECHO (Primary)	400-13 EMS-Airline	1 MARY
400-6 Maint/Admin	1 FOXTROT	400-14 Fireground	1 NOVEMBER
400-7 EMS Dispatch	1 GULF	400-15 Fireground	1 OSCAR
400-8 EMS Info	1 HOTEL		

City: San Antonio Northeast Satellite

System: 20 Chan Type I
 Name: System 2 (Coopers Tower)
 Location: 1604 and Judson (Coopers Tower)
 Fleet Map: S-13, S-12, S-12
 Freqs: 856-860 2375, 4875, 7375, 9875
 Controls in the lower end, i.e. 856-857 2375, 7375
 Talk Group Designators
 000=Police Patrol
 400=Fire/EMS
 600=CID/Park Rangers

Police Patrol

000-1 Northeast 31xx, 32xx, 33xx (patched to system 1)
 000-9 Information (patched to system 1)

Police Central Intel Div

Not heard over here

Fire/EMS

All information is the same as system 1 except they use the 2 designators
 400-1 Fire Dispatch (multicast on all systems)

San Antonio NW Police Satellite

City: San Antonio	Freqs: 856-860 9375
System: 5 Chan Type I	Talk Group Designators
Name System 3 (Prue Road)	000=Police Patrol
Location Medical Center	400=Fire/EMS
Fleet Map: S-13, S-12, S-12	600=CID/Park Rangers

Police Patrol

000-2 Northwest 71xx, 72xx
 000-9 Information (patched through to system 1)

Police Central Intel Div

Not heard over here

Fire/EMS

All info is the same as system 1 except they use the 3 designators
 400-1 Fire Dispatch (multicast on all systems)

Bexar County

County: Bexar	Freqs: 856-860 2375, 4875, 7375, 9875
System: 20 Chan Type I	Controls in top 4 chans 860, 9875 being ch 1
Name: None given	Talk Group Designators
Location: Tower of Americas	000=Public Works
Fleet Map: S-13, S-12, S-12	400=Sheriff
	600=Airport ops

Sheriffs Patrols

400-8 East Patrol
 400-9 West Patrol

San Antonio International Airport

600-0 Airport Police	600-2 Airport Maintenance
600-1 Airport Police Tac 2	600-3 Airport Operations

Other TrunkTracking Resources

A new Worldwide Web site, www.trunktracker.com, promoted in the manual and frequency guide included with the new scanner, was

up and running in mid-June of this year. Be sure to check out this site out for FAQs (Frequently Asked Questions), trunktracking tips, frequencies, and, of course, ID's and fleet maps around the United States and eventually around the world. We'll have more details on this and other relevant web sites in an upcoming issue.

L.A., My Kind of Monitoring Town

It is a question hobbyists often ponder, "What is the best place in the nation to scan?" Up until very recently, it was anywhere that did not have Motorola analog trunking. Atlanta? Forget it! Ft. Worth? No way. Miami? Nope.

The TrunkTracker has changed the playing field considerably. Still, regions with EDACS systems, such as Denver, New Orleans, Hartford, and the like, are still pretty much unmonitorable, or, at the very least, it's sure no fun to scan there! We've been over EDACS before, with its beeps and buzzing — not to mention the trunking, which is a nightmare to monitor.

Back to the issue at heart, though. Where is the best place to monitor, especially now that we have many cities we can lump back into the mix? I had long felt that Washington, D.C., and New York City were tied for the best. New York, of course, has, as one would expect, as much action on the airwaves as you'll find pretty much anywhere in the world — particularly police activity. Snowstorms and hurricanes spice up the day-to-day fare.

New York also covers five boroughs of cities which are themselves as large as almost any other city in the nation, three extraordinarily busy airports, lots of marine and rail traffic, sprawling suburbs, and three states in which to monitor (New York, New Jersey, and Connecticut).

Washington has the D.C. area, plus Maryland and Virginia. While it is a much smaller area, the District has, of course, a tremendous amount of federal and military communications to sniff out.

Here's a nomination, though, for Los Angeles. LA also has all the aforementioned radio features of New York, plus earthquakes, fires, and other disasters in place of snowstorms and hurricanes. It also has its share of unique monitoring challenges: movie studios, amusement parks, and much more. At this time, the majority of Los Angeles city and county police and fire communications are in the clear on UHF radio systems. However, many of the other city and county services operate on large-scale Ericsson trunking radio systems.

Still, monitoring in LA is a blast. There's tremendous action, from the mundane to the serious, on just about all police and fire channels. I was lucky enough recently to experience this action first-hand. Thanks to Gene Hughes of *Police Call Plus*, I got a taste of what it's like in a major-city precinct house and on patrol with an LAPD officer.

Gene volunteers at an LAPD station. He mans the front desk and assists citizens with all manner of situations. Gene also spends time meeting with home and apartment dwellers and advising them on the best way to protect themselves and their property against crime. As editor and publisher of *Police Call Plus*, it's a natural for Gene to work with the police. It's great to see people give something back to their community and local law enforcement agency.

The LAPD is most impressive, and I'll have more on my ride-along with this agency, my visit to the Los Angeles 9-1-1 communications center, and on the LAPD radio system, soon.

We're curious to hear your thoughts on this "Best City to Monitor" issue. We'll address this topic again in a later article and focus on specifics, such as how certain frequencies — NYPD's SOD (special operations division) channels, for example — make monitoring easier in such complex scanning areas.

Great Books!

How to Investigate Your Friends, Enemies, & Lovers

Trent Sands & John Q. Newman

180 pages, large format, \$19.95

A great collaboration by the masters at penetrating PERSONAL secrets... Military records, Internet, bankruptcies, private investigators, Freedom of Information Act, criminal records, permits & licenses, and MUCH MORE! The best and most current investigation book in print today. **NEW FOR 1997!**

Radio Monitoring

T.J. "Skip" Arey

The How-To Guide

N2EI

The complete hands-on guide to the world of communications! Who's listening, how they do it, what equipment "works." For the expert or the novice... the #1 book in scanning and monitoring today!

344 pages, \$19.95

NEW!

"...covers it all, from DC to daylight..."

WorldScanner Report

ULTIMATE SCANNER

Scanner modifications - **THREE** 240 pages, large format, \$29.95

Bill Cheek is the master of scanner modification, as Editor of the **World Scanning Report** and author of **Scanner Modification Manuals**.

SCANNERS & Secret Frequencies

Henry Eisenson

320 pages, \$19.95

"Must reading." *Electronics Now* "Useful, knowledgeable..." *PopComm* "A giant undertaking...authoritative" *Monitoring Times* "...can't miss!" *ASG* "Absolutely the best..." *Norm Schrein* "A high point!" *RCMA*

Underground Database

100 pages, large

Everything that's sort of legal. "Fascinating" *ASG* format, \$23.75

Television GRAY Market

Henry Eisenson

Cable & satellite chips, descramblers, etc. 160 pages, \$23.75

"Explores this shadowy fringe area... good info." *PopComm*

www.indexbooks.com/ipgbooks

s/h \$4.75 1st book, then \$2.50 ea. CA add tax

INDEX

Publishing Group, Inc.

MO/check via mail

3368 Governor Drive, Suite 273M

MCARD, Visa, AmEx

San Diego, CA 92122

800-546-6707

Ready for
Windows 95

AT LAST!

High performance, full featured scanning under Windows!

With Scan*Star™ for Windows you can scan and search at full speed AND run other programs at the same time, with little or no performance impact!

- o Scan with up to 10 radios at the same time.
- o Proprietary Scanning Engine™ technology for full performance under Windows - only Scan*Star has it.
- o Browse and import directly from DBASE files such as Grove or Percon FCC databases.
- o Real time spectrum display on R7100, R9000, AR8000, OS456, OS535, and AR3000(A). Tactical scan display.
- o Use any serial port, even COM3/4 when COM1/2 are in use. Will work with 4 and 8 port cards too!
- o Scan by PL/DPL tone with OS456, OS535 & DC440.
- o Scan multiple groups, banks and search ranges, all at the same time! Alarms for priority channels.
- o Automatically unblock AR8000, band plan editor.
- o Logs air time, hits, signal, time/date, PL, DTMF & more.
- o Easy to use data editor. Exchange data with other file formats. Read/write channel memory and much more!

Equipment Supported:

OS456, OS535, R7100, R7000, R9000, FRG9600, DC440, AR3000(A), AR8000 (EDCO, Opto & AOR I/F supported.).

System Requirements:

IBM PC 386/486/586 with 4 MEG ram, hard disk, VGA, mouse, serial ports. Windows 3.1 or 95. Cables and interfaces for radios may also be required.

Scan*Star for Windows \$159.97

Commercial Edition [DOS] \$129.97

Professional Edition [DOS] \$79.97

Add S/H & TAX. Visa, MC, AMEX cards accepted. No COD.

To order call: **1-408-926-5630**

Signal Intelligence
The Leader in PC
Radio Scanning
PO BOX 640891
San Jose CA 95164

FREE DEMO

Download from Scan*Star BBS

1-408-258-6462

URL: <http://www.scanstar.com>



LENTINI
COMMUNICATIONS, INC.

Toll Free 1-800-666-0908

RELM HS 200

Multi-Band Programmable Scanner

- Multi-Band, Programmable Scanner, 13 Band Coverage From 26,000 MHz Thru 960,000 MHz.
- Includes 6 Meters and Aircraft.
- PL/CTCSS and DPL/DCS included!
- 200 Channels, 10 Banks, 10 Priority Channels.
- Birdie Lockout, Channel Lockout.
- Scan Speed Up To 100 Channels Per Second.
- HS200 Comes With A Metal Belt Clip, AC Adapter, Ear Piece, & Carrying Strap. (4 AA Batteries Not Included).
- Many Other Features.



\$239.95
UPS Included

YAESU FT-50RD/5 Watt

Ultra Compact Dual Band Handheld

*NOW WITH CTCSS ENDODE AND DECODE BUILT-IN!

Receive: 76-200MHz, 300-540MHz
590-999MHz cellular blocked
Transmit: 144-148MHz
430-450MHz

- AM Aircraft Receive
- Digital Coded Squelch
- High Speed Scanning
- 112 Memory Channels
- Much, Much More!

Full line of accessories in stock such as speaker mikes, rapid charger, DC cord, cases, etc.

Ask About Battery Special



Deluxe Leather Cases w/Quick Disconnect Swivel
Belt Loop for All Handheld Scanners - \$29.95

GMRS 210+3

10 UHF Channels,
CTCSS
2 Watts Output
(5 watts at 12VDC)

\$179.95 UPS incl.

MAXON



SM-2000 Series

Synthesized Scanning Mobiles
UHF & VHF Versions Available

- 25 Watts
- 4 Channels
- CTCSS/DCS

\$289.95
UPS inc.

- For Business or GMRS Use
- 40 Watt, 16 Channel Model \$369.95
- Handheld Units Available-Call For Info.

PROGRAMMING INCLUDED ON ALL MAXON RADIOS

SM-4000

- 40 Watts
- CTCSS/DCS
- 16 channels
- Other HT's

\$329.95 VHF **\$369.95** UHF
UPS Included

SP-2000 Series

5 Watt 4 Channel

SL-70W Series

5 Watt, 16 Channel

Starting at \$299.95

NEW!

SP-120 Handhelds

UHF & VHF
Versions Available

- 2 Watts
- 4 Channels
- CTCSS/DCS

Programmable,
Scanning Portable

\$199.95

Complete
w/Wall Charger

CHEROKEE & COBRA CB

CHEROKEE

• CBS-1000 AM/SSB base

\$279.95

AH-27 40 Channel

Handheld

AH-100 AM/SSB

Handheld

COBRA 29LTDST

"Soundtracker" Mobile

NEW!

Maxon • Family Radio Service

FRS-114 • No License Required

\$89.95

each

BC9000XLT

\$379.95 delivered

UNIDEN

NEW! BC235XLT

"Trucktracker"

\$269.95 UPS Incl.

BC3000XLT

\$359.95 delivered

AOR

IC-8500

ICOM

IC-R10

AR8000

CALL FOR PRICING

SANGEAN

ATS909

New From Sangean

AM/FM/SSB

Shortwave

GRUNDIG

Shortwave

Yacht Boy 400

Conn Sales Infor. & Tech Help
860-666-6227

21 Garfield St. Newington, CT 06111

C.O.D.'s OK - SAME DAY SHIPPING

HOURS: M-F 10am - 6pm
SAT 10am-4pm
UPS Ground (48 states)

Another HF Maritime Station to Close

I have some more sad news for high frequency (HF) maritime buffs. The days of Holland's most famous utility station, Scheveningen Radio (PCH), are numbered. The services of Scheveningen Radio will be discontinued as of January 1, 1999. At the end of this year part of the radio telephone services will be discontinued.

The reason for the closure of PCH involves a European government regulation which states that as of January 2, 1999, all ship traffic will be carried via the 1.5 GHz maritime satellites of INMARSAT. This is also the date that the Global Maritime Distress and Safety System (GMDSS) service becomes operational via INMARSAT satellites.

So, PCH is another "catch-and-QSL-while-you-can" maritime coastal station. Thanks to *UW* regular Ary Boender in the Netherlands for this information.

FCC Approves KPH/WCC Transfer

Approval has finally been received from the Federal Communications Commission for the transfer of the licenses for KPH-San Francisco Radio, California, and WCC-Chatham Radio, Massachusetts, from WUI (a division of MCI) to Globe Wireless Radio Network. This changeover occurred on June 30, 1997.

Bahrain Radio, call sign A9M, has joined the Global Radio Network. The station is located on the island of Bahrain in the central Arabian Gulf and offers superb coverage of the Indian Ocean and Eastern Mediterranean Sea. Test transmissions began on May 7, 1997. The station is now in full commercial operation.

Bahrain Radio is operated by Batelco, the national telephone company of Bahrain. Test transmissions have been monitored on 4347.0, 8541.0, 12668.0 and 17066.5 kHz. Operation on 19726.0 kHz is expected soon.

The A9M transmit site is located at latitude 26 degrees, 12 minutes North, and longitude 50 degrees, 36 minutes East.

The antenna complement includes four half-wave dipoles. The transmitters for SITOR and GlobeEmail services are Henry model 5000. Ten Tec model 330A receivers are in use for the SITOR and GlobeEmail services.

Globe Wireless On-Air from the Great Lakes

Rogers City Radio, call sign WLC, has also joined the Global Radio Network. Full commercial operation from Rogers City began on March 31, 1997.

Rogers City Radio is a proud and historic radio station on the Western shore of Lake Huron and offers superb coverage of the Great Lakes Basin. It was originally constructed by United States Steel in the 1930s. The current owner, Central Radio & Telegraph Company, operates four transmitters and receivers for Globe Wireless as well as providing voice services to vessels on the Great Lakes.

The WLC transmit site antenna complement includes half-wave dipoles, and vertical towers. Four transmitters are in use for SITOR

service on medium frequency (2 MHz) and HF (4, 6, and 8 MHz) maritime bands. Additional transmitters are in use for voice services.

The receivers for WLC are located two miles south of the transmitting site. The antenna complement includes various dipoles. The receivers in use for Globe Wireless services are Ten Tec model RX-330A.

Below is a list of International Telecommunications Union (ITU) narrowband direct printing (NBDP) channels and associated frequencies, including those currently in use by Rogers City Radio.

Voice Services

In addition to being a node on the Global Radio Network, WLC provides upper sideband (USB) and very high frequency (VHF) voice service to vessels on the Great Lakes. Various MF, HF, and VHF channels are used for this service. The frequencies used are listed in the following table.

WLC Voice Channels			
Channel Number	Shore Transmit	Ship Transmit	
-----	2182.0	2182.0	Distress & Calling
57	2514.0	2118.0	Primary MF
-----	2550.0	2158.0	
-----	2582.0	2206.0	
405	4369.0	4077.0	Primary HF 4 MHz
409	4381.0	4089.0	
418	4408.0	4116.0	
826	8794.0	8270.0	Primary HF 8 MHz
VHF-16	156.800 MHz	156.800 MHz	Distress & Calling
VHF-26	161.900 MHz	157.300 MHz	
VHF-28	162.000 MHz	157.400 MHz	

Global Radio Network® Channel and Frequency List

The frequencies listed below are used by the various stations in the Global Radio Network. Those with an entry in the ITU channel number column are standard ITU radio telex NBDP channels (500 Hz spacing). Most of these frequencies are on the air 24 hours a day and the most common mode you will encounter is SITOR-A/B.

Global Radio Network							
ITU Ch Number	Shore Transmit	Ship Transmit	Station Callsign	ITU Ch Number	Shore Transmit	Ship Transmit	Station Callsign
228	1620.5	2155.5	SAB	617	6322.0	6271.0	ZSC
----	2137.5	2070.5	WLC	625	6326.0	6275.0	KEJ
401	4210.5	4172.5	WNU	626	6326.5	6275.5	SAB
402	4211.0	4173.0	ZLA	627	6327.0	6281.0	WNU
403	4211.5	4173.5	KFS	632	6329.5	6283.5	VCT
404	4212.0	4174.0	WLC	802	8417.0	8377.0	ZLA
406	4213.0	4175.0	VIP	803	8417.5	8377.5	KFS
408	4214.0	4176.0	ZSC	804	8418.0	8378.0	WLC
-----	4259.0	4166.5	SAB	806	8419.0	8379.0	VIP
-----	4300.4	4154.5	KEJ	819	8425.5	8385.5	WNU
-----	4347.0	4157.5	A9M	830	8431.0	8391.0	KEJ
602	6315.0	6263.5	ZLA	831	8431.5	8391.5	ZSC
603	6315.5	6264.0	KFS	837	8434.5	8394.5	SAB
604	6316.0	6264.5	WLC	838	8435.0	8395.0	VCT

ITU Ch Number	Shore Transmit	Ship Transmit	Station Callsign	ITU Ch Number	Shore Transmit	Ship Transmit	Station Callsign
-----	8541.0	8305.5	A9M	1602	16,807.5	16,684.0	ZLA
1202	12,580.0	12,477.5	ZLA	1606	16,809.5	16,686.0	VIP
1203	12,580.5	12,478.0	KFS	1619	16,816.0	16,692.5	ZSC
1206	12,582.0	12,479.5	VIP	1647	16,829.5	16,706.5	KFS
1210	12,584.0	12,481.5	VIP	1657	16,834.5	16,711.5	WNU
1219	12,588.5	12,486.0	WNU	1673	16,842.5	16,719.5	KEJ
1244	12,601.0	12,498.5	ZSC	1676	16,844.0	16,721.0	VCT
1257	12,607.5	12,505.0	WNU	1691	16,851.5	16,728.5	SAB
1263	12,610.5	12,508.0	VCT	-----	17,066.5	16,554.5	A9M
1265	12,611.5	12,509.0	KEJ	1824	19,692.5	18,882.0	ZSC
1291	12,624.0	12,522.0	SAB	-----	19,726.0	18,850.5	A9M
-----	12,668.0	12,373.5	A9M	2203	22,377.5	22,285.5	KFS

Global Traffic Lists

The combined Global Radio Network traffic list is broadcast (via radio telex SITOR Mode B) every other hour from the stations listed below.

Global Radio Transmit Schedule

Call	Station Location	Hour	Time
A9M	Bahrain Radio, Bahrain		
-----	-----		
KEJ	Hoolehua Radio, HI USA	Even	H +15
KFS	Palo Alto (San Francisco) Radio, CA USA	Odd	H +25
SAB	Gothenburg Radio, Sweden	Even	H +35
VCT	St. Johns Radio, Newfoundland, Canada	Odd	H +05
VIP	Perth Radio, Western Australia	Even	H +45
WNU	Slidell (New Orleans) Radio, LA USA	Even	H +55
ZLA	Awanui Radio, New Zealand	Odd	H +45
ZSC	Cape Town Radio, South Africa	Even	H +25

■ USAF Getting New VIP Aircraft

The U.S. Air Force (USAF) is ordering some new aircraft for their VIP squadron, the 89 Air Wing at Andrews AFB, Maryland. They are ordering new Gulfstream V and Boeing 757 aircraft. The new USAF designators for these aircraft will be C-37A and C-32, respectively.

And speaking of the Air Force, an anonymous source has passed along an exclusive list of the new U.S. Air Force Scope Command automatic link establishment (ALE) frequencies. You should hear some very interesting transmissions on these frequencies as well as ALE bursts. All voice transmission should be in USB.

3059 3137 4721 5708 6715 6721 7632 8965 9025 9057 11126 11250 13215
15043 18003 20631 23337 27870 kHz.

My anonymous source also indicates that Thule Global in Greenland has a new discrete frequency of 11271 kHz.

And while you are scanning the Scope Command ALE frequencies, don't forget to check the Global HF System (GHFS) primary frequencies. You will hear a lot of the U.S. military voice traffic from aircraft, ships, and ground units on these Joint Chiefs of Staff sponsored network frequencies.

4724 6712 6739 8968 8992 11175 11244 13200 15016 17976

I recently asked a question in this column about who uses the callsign S4JG that you occasionally hear on the Global HF System. Two folks who will remain anonymous and are "in the know" answered my query and confirmed what I have been told privately on several different occasions.

S4JG is used by U.S. Navy maritime/anti-submarine warfare patrol aircraft (P-3 Orions) to conduct pre-flight comm checks prior to a mission. So the next time you hear that call on 11175 or 8971 kHz (USN Atlantic Safety of Flight freq), you're listening to a Navy P-3 getting ready to go flying.

■ Cuts put strain on Mayday monitor

We started on some bad news about HF maritime monitoring and unfortunately, we close on some more. Robert Williams forwards this interesting bit of information on the Australian maritime radio scene via an article that was published on June 2, 1997, in the *Sydney Morning Herald* by Anthony Hoy. The demise of HF marine frequencies continues.

Australia will have only one person in Perth monitoring 30 million square kilometers—or a thirteenth of the world's oceans—for distress calls on as many as 12 high-frequency radio channels, while simultaneously issuing weather forecasts.

Federal Government funding cuts have forced the closure from July 1 of key maritime communication stations responsible for Safety of Life at Sea (SOLAS) services to a total area of 47 million square kilometers, the Community and Public Sector Union (CPSU) says.

Stations at Perth and Brisbane will take on the workload of stations to be closed at Darwin and Townsville, doubling the weather forecasting and HF loads of stations "already responsible for the most climatically volatile areas of Australia's oceanic responsibilities," union secretary Mr. Adrian O'Connell said.

The stations are manned around the clock by one person on a 12-hour shift. Their main function is to listen for distress signals against the "exceptionally noisy atmospheric background" on HF radio channels.

"This situation is unprecedented in the world, and the risk of missing a distress call on HF radio is real and unacceptably high," Mr. O'Connell said.

"The Australian Government is putting at risk the lives of Australian and foreign sea-farers."

Australia is still basking in the glory of the spectacular rescues of Tony Bullimore, Raphael Dinelli, and Thierry Dubois in the Vendee-Globe Around the World Yacht Race in December. All were equipped with the latest global satellite tracking equipment.

"But the satellite technology is not being picked up as quickly as expected," the union's industrial officer, Mr. Jason Pascoe, said.

"Smaller yachts and fishing trawlers are not required to move from HF radio to satellite communications until February 1999. Most simply cannot afford to do so. They are the ones we are concerned about."

Telstra is contracted to provide SOLAS services to the Australian Maritime Safety Authority. The CPSU, says the Government, has pruned funding for this work by about \$2 million.

A spokesman for the Minister for Transport, Mr. Sharp, said Telstra had "guaranteed that the services can be provided adequately and satisfactorily," and that Mr. Sharp had been assured by the authority that its SOLAS obligations "would be properly fulfilled." "This is an industrial matter between Telstra and the union," Mr. Sharp's spokesman said.

But Mr. O'Connell said there was no industrial dispute. "Telstra is only the service provider for the Government's maritime safety obligations," he said.

After spending \$1 million on a two-day search, Australian rescue authorities last night called off the hunt for a ship reported missing in the stormy Tasman Sea, believing there was "a high probability that it's a hoax."

Now it's time to see what you have been monitoring this month in the world of utility communications.

Abbreviations used in this column

AM	Amplitude Modulation	MERS	Mobile Emergency Response System
ANDVT	Advanced Narrowband Digital Voice Terminal	MOI	Ministry of Information
ARC	American Red Cross	NAS	Naval Air Station
CanForce	Canadian Forces	NASA	National Aeronautics and Space Administration
CFL	Confidential Frequency List	NECN	National Emergency Coordination Net
COMNAV	Communications and Navigation	RCC	Rescue Coordination Center
CP	Command Post	RTTY	Radioteletype
CW	Continuous Wave (Morse code)	SAM	Special Air Mission
DV	Distinguished Visitor	SATCOM	Satellite Communications
EAM	Emergency Action Message	SHARES	Shared Resources
ETA	Estimated Time of Arrival	UHF	Ultra High Frequency
ETB	Estimated Time to Base	Unid	Unidentified
FEMA	Federal Emergency Management Agency	USAF	U.S. Air Force
GEP	Ground Entry Points	USB	Upper Sideband
GHFS	Global HF System	USDA	U.S. Department of Agriculture
HF	High Frequency	UTC	Coordinated Universal Time
MARS	Military Affiliate Radio System	VIP	Very Important Person

All transmissions are USB (upper sideband) unless otherwise indicated. All frequencies are in kHz (kilohertz) and all times are UTC (Coordinated Time Universal)

- 6730.0 SAM 202 working Andrews VIP regarding primary frequency at 2340. SAM 202 working Andrews VIP for signal checks on this new primary frequency at 0206. (Jones-CA) E1F (DV2+10) with phone patch to Andrews at 1334. Casey 01 calling Andrews on F267 at 1900 and moved to 6993 F-117. Air Force One working Andrews at 0231. SAM 29000 working Andrews in the clear and with ANDVT at 2032. Also heard 29000 at 0011 with patches to the State Department and also using 13440. (Anonymous-NE)
- 6736.0 Delta 3 Bravo working Oscar 0 Kilo at 0411. (Anonymous-NE)
- 6761.0 Gold 61 trying to raise Skybird. No joy at 1622. (Jones-CA)
- 6786.0 Unid station with 5 letter groups in CW at 1125. (J.L. Metcalfe-KY)
- 6840.0 EZI-English female Israeli Mossad numbers station at 2200 with coded message traffic. (Dean Burgess-Manchester, MA)
- 6870.0 FDG-French Air Force with CQ CW marker at 2140. 6871.5 is listed in the CFL. (Yamaguchi-Japan)
- 6993.0 SAM 974 (DV + 7) ETB Andrews AFB: 0615, working Andrews VIP for phone patch to SAM Command. Previously up on 11220.0 and 13211.0 at 0239. Air Force 2 (DV-2 + 27) departed at 0155. ETA "next destination" 0555, working Andrews VIP for a phone patch into Waldorf regarding using RF-4 out of various GEPs and another phone patch into SAM Command at 0205. (Jones-CA) Air Force One working Andrews on F117 (mostly ANDVT) at 0046. (Anonymous-NE)
- 7595.0 New Castle working Missouri at 2323 and calling Buckeye at around 0200. Clear and secure modes used over a couple of days. (Metcalfe-KY)
- 7862.3 AFA1NW in 300 baud packet at 1123. USAF MARS. (Metcalfe-KY)
- 7918.0 YHF-Israeli Mossad number station at 1330. (Yamaguchi-Japan)
- 8026.0 Executive-1-Foxtrot with ETA KLAX at 0155 and SAM 974 (DV-2 + 19) ETA Andrews at 0400, working each other and Andrews VIP at 0046. SAM 202 working Andrews VIP for signal checks on this new primary frequency at 0140. Navy 676 (DV-2 + 6) airborne at 2105. ETA Peterson AFB at 2315, working Andrews VIP with periodic signal checks at 2109. SAM 202 (DV-2 + 8) ETA to Sheppard AFB at 2040, working Andrews VIP regarding arrival at Sheppard. Final destination is Andrews AFB with an ETA of 0000. Communications heard at 1759. (Jones-CA) SAM 50050 calling Andrews at 2124. (Anonymous-NE)
- 8042.0 Trout 99 with a phone patch to Rhein Main Base Ops via Andrews on possible F-003. (Anonymous-NE) *My records indicate that this is F290. F003 should be 8036.0-Larry.*
- 8047.0 SAM 974 (DV-2 + 19) departed Ontario at 2345, for Andrews AFB, ETA 0400, working Andrews VIP and E-1-F at 2350. (Jones-CA)
- 8134.0 Another unid station with 5 letter groups in CW at 1213. Lots of these stations noted recently. Other frequencies have included: 7846.0, 8187.2, and 9320.0 kHz. (Metcalfe-KY)
- 8331.0 4XML-Unid station repeating "V BFR7 DE 3XML" in CW at 0855.
- 8464.0 English female 5-digit Lincolnshire Poacher number station at 2215. (Yamaguchi-Japan)
- 8638.0 VNG-Sydney, NSW, Australia, with AM time signal at 0524. (Anonymous-NE)
- 8641.0 KPA2-Israeli Mossad number station repeating "Kilo Papa Alpha Two" for more than 30 minutes at 1347. An abnormal Mossad numbers transmission. (Yamaguchi-Japan)
- 8843.0 NR16020-Linda Finch around the world flight working Honolulu. Later they went to 3413/5574. There was a navigator flying with Linda. Honolulu handed them over to San Francisco on 5574 when Honolulu lost contact with them. Support aircraft was aircraft number 44RD. (Anonymous-NE)
- 8957.0 Shannon, Ireland, VOLMET with aviation weather at 0409. (Anonymous-NE)
- 8989.0 Trenton military working unid station at 1459. (Anonymous-NE)
- 9016.0 PACOM 01 working Hickam with write-ups at 0035. SPAR 64 working Hickam with phone patches regarding arrival at Cairo. Previously up on 8968.0 and 15043.0 at 0459. (Jones-CA)
- 9023.0 Thumper working Deer Hunter at 1809, moved to 11214 at 1819. (Anonymous-NE)
- 9120.0 Cactus and Nightwatch 01 with clear/secure transmissions at 1424. (Metcalfe, KY) Nighthawk 12 working Cactus at 0104. Cactus told Nighthawk 12 to contact Desert on November in the clear. (Anonymous-NE)

- 2953.0 VLB2-Israeli Mossad number station at 2127. (Takashi Yamaguchi-Nagasaki, Japan)
- 4442.0 SPAR 65 working Andrews on F499 at 0502. (Anonymous-NE)
- 4458.0 Nightwatch 01 working Andrews at 0726 on F710. (Anonymous-NE)
- 4491.0 Snow Drift calling Deputy Dog at 0545. (Anonymous-NE)
- 4577.0 6PXJ-Unid station repeating "V ABY7 DE 6PXJ" in CW at 1027. (Yamaguchi-Japan)
- 4645.0 English female 3/2-digit number station at 0131. (Anonymous-NE)
- 4665.0 VLB2-Israeli Mossad number station repeating "Victor Lima Bravo Two" for more than 30 minutes at 2125 with heavy interference from Tokyo aeradio (4666 kHz). An abnormal Mossad transmission. On another day heard MIW at 2117. (Yamaguchi-Japan)
- 4670.0 English female 3/2-digit number station at 0131. (Anonymous-NE)
- 4721.0 SAM 29000 working Andrews on F877 at 0115. PACCOM 01 working Andrews at 0546 on F877 (also on 8026 F290, 8047 F752, and 10586 F974). Air Force Two working Andrews here on F877 and also on 6993 F117 and 11460 F295. (Anonymous-NE)
- 4742.0 Air Force 2 shutting down communications with Andrews VIP at 0222. (Jeff Jones-San Francisco, CA)
- 4780.0 KPA2-Israeli Mossad number station at 2117. (Yamaguchi-Japan)
- 5438.5 L9CC-Unid station repeating "V CP17 DE L9CC" in CW at 1245. (Yamaguchi-Japan)
- 5670.0 Madras aeradio, India, in contact with various aircraft at 2045 in heavily accented English. (Yamaguchi-Japan)
- 5696.0 NMN-CAMSLANT Chesapeake, VA, working Rescue 2126 regarding a SAR operation. Shifted to 8980 and was also talking to the *USS John Stennis* about the sailing vessel *Gull*. (Albert Byner-Hanahan, SC)
- 5705.0 Newsroom calls Nightwatch to enter the net at 0500. They move to 9016 for more better comms. (Duke Rumley-Mayodan, NC)
- 5715.7 Unid station repeating "ETT 40" in CW at 1040. (Yamaguchi-Japan)
- 5750.0 4XML-Unid station repeating "V BFR7 DE 4XML" in CW at 1245. (Yamaguchi-Japan)
- 6658.0 MIW-Israeli Mossad number station at 1515. (Yamaguchi-Japan)
- 6683.0 SAM 300 (DV-2 + 9) airborne at 0230. ETA Andrews 0310 working Andrews VIP. Preflight frequency checks included: 6730.0, 6683.0, 9120.0, 4610.0, and 9017.0 most of which were out of the Offutt site. (Jones-CA) Air Force Two (SAM 31681) working Andrews on F731 at 1627 then moved to 8026 F290. SAM 20375 with phone patch traffic via Andrews at 1423. Also used 11053 F354. (Anonymous-NE)
- 6694.0 Rescue 106 with a phone patch to RCC via Halifax military at 0330. (Anonymous-NE)

- 9121.0 Wild Eagle calling Eagle's Nest for a radio check and then any station for a radio check. No joy on both at 1847. (Jones-CA)
- 9317.0 SAM 049 departed Gander at 0410, ETA Andrews AFB at 0710, working Andrews VIP on Air Force One's new secondary freq F-709 at 0420. (Jones-CA)
- 9320.0 SPAR 67 with a phone patch via Andrews at 1605. (Anonymous-NE)
- 9958.0 English female 3/2-digit number station in AM at 1801, parallel to 10783.5. (Anonymous-NE)
- 10202.0 SAM 204 working Andrews VIP with phone patch to COMNAV regarding SATCOM problems at 2322. (Jones-CA) SAM 60202 and SAM 60204 working Andrews on F904 (talked about going to F814) at 2140. (Anonymous-NE) *F814 would have been 6989.0 kHz-Larry.*
- 10493.0 KA80699-Unit station, in comms with WGY908-FEMA Denver, CO, and trying for WGY906-FEMA Denton, TX. KA80661 heard a couple of months ago on 5211.0 and possibly IDing as WV DES. Artistic Style with a H212145 message for WGY918-FEMA MERS at Denver, CO, at 2145. KCR873-USDA Boise, ID, and KCI615-ARC, Falls Church, VA, in FEMA's NECN net at 1658 and 1928, respectively. (Metcalf-KY)
- 10581.0 ALE burst here at 0107. It's hard to be accurate on the frequency without a corresponding voice transmission. More ALE transmissions noted on 7622.0 at 1215. (Metcalf-KY)
- 11053.0 Elmendorf GHFS with an EAM at 0440. McCellan GHFS with a Foxtrot EAM: "Skyking Skyking do not answer. 3SF, authentication: NM" at 2133. PACOM 01, enroute Andersen, checking Andrews VIP here for a possible new primary from their previous: 11460.0 at 0403. Last local night SAM 417 (a.k.a. WALT 01) was also enroute to Andersen. (Jones-CA) SAM 60202 () DV+01 with a phone patch to Andrews CP via Andrews on possible F655. (Anonymous-NE) *Interesting. My notes indicates that this is F354 and I do not have a current listing for F655-Larry*
- 11214.0 Executive-1-Foxtrot, working Andrews VIP regarding a 0155 arrival at KLAX and coming up on MUX with SAM 974 at 2142. SAM 683 working Andrews VIP reporting block time, and requesting preflights for 180009 at 0155. SAM 300 working Andrews VIP with signal checks at 1852. SAM 29000 (sounded like) working Andrews VIP with preflight signal checks at 1856. SAM 202 (DV-2 + 6) departed at 2220, ETA "KCVS"(Cannon AFB) at 2350, working Andrews VIP with phone patch to SAM Command at 2221. Gave UHF frequency for KCVS as 372.2 MHz. SAM 974 checking Andrews VIP for signal strength out of various comm levels at 2005. (Jones-CA) Darkstar November (USAF E-3 AWACS 965th AACS/552nd ACW, Tinker AFB, OK) with a phone patch via Trenton military at 1715. SAM 60203 (DV2+6) with a phone patch to Andrews at 1715. Thumper with a phone patch to Deer Hunter via Trenton military at 1758. (Anonymous-NE)
- 11217.0 Jaguar 45 working MacDill GHFS with phone patch traffic from calling party on board Delta-031 at 0200. Possie 62 enroute Pope AFB via Roosevelt Roads and Guantanamo Bay working MacDill GHFS with phone patch traffic to Hilda East at 2324. (Jones-CA) PACAF 01 working MacDill GHFS at 1635. (Anonymous-NE)
- 11220.0 SAM 682 (DV-2 + 19) ETA NAS North Island at 0430, working Andrews VIP with phone patch traffic at 0239. SAM 28000 trying to raise Andrews VIP for a signal check. No joy at 0038. And also on freq: NIGHTWATCH 01, apparently in connection with the above comms, working Andrews VIP with signal checks at 0142. SAM 417, also IDed as "WALT 01" (?) enroute Andersen, with an ETA of 1000z, working Andrews VIP with phone patches and signal checks at 0050. Casey 01 (DV-3 + 19) departed Randolph AFB, TX, at 2159. ETA Langley AFB at 0100, working Andrews VIP at 2204. Navy 511 (DV-3 + 8) enroute to China Lake working Andrews VIP with phone patches at 0005. (Jones-CA) Navy 50511 (2033), SAM 60203 (1510), PACAF 01 (2151), and SAM 26000 (2355) working Andrews on F-311. (Anonymous-NE)
- 11226.0 SAM 202 (DV-2 + 9) ETA Peterson AFB at 0100 working Andrews VIP with phone patch traffic at 2345. (Jones-CA) SPAR 64 with a phone patch to ECC Metro via Lajes GHFS at 0613. (Anonymous-NE)
- 11460.0 Air Force 1 working Andrews VIP and going to ANDVT at 0012. SAM 206, ETA to MacDill AFB at 2040 working Andrews VIP for phone patches into MacDill AFB at 1942. SAM 206 working Andrews VIP at 1758. SAM 26000 (0 DV + 31) enroute Dulles, ETA 1030 working Andrews VIP at 0015. (Jones-CA) Navy 49676 calling Andrews at 1738. SAM 56974 working Andrews at 0155. (Anonymous-NE) *My records indicate that this is a VP-3A flown in support of the Navy Chief of Naval Operations (CNO)-Larry.*
- 11570.0 English female 5-digit Cherry Ripe number station at 1300, also noted on 13866. (Yamaguchi-Japan) *OK, I'll bite, Takashi-san. What is a Cherry Ripe numbers station?-Larry*
- 12029.0 SVB3/4/5-Athens Radio, Greece, with a CW marker at various times. (Richard Parker-Rochester, NY) *That is an interesting frequency, Richard. I haven't seen them reported on this one in the past-Larry.*
- 12693.0 UGC-Unid station with CW marker at 2246. (Parker-NY) *This is Saint Petersburg Radio in Russia. Rich-Larry.*
- 12721.0 SPH61/81-Gdynia Radio, Poland, at 1614 with a CW marker. (Parker-NY)
- 12748.0 IRM-CIRM Rome Radio, Italy, with CW marker at 2300. (Parker-NY)
- 12750.0 CWA-Unid Brazilian station with CW marker at 2302. (Parker-NY) *This is actually Cerritos Radio in Uruguay. Rich-Larry.*
- 12780.0 D3E51/61-Luanda Radio, Angola, with CW marker at 2308. (Parker-NY)
- 12780.5 9AR-Rijeka Radio, Croatia, with a CW a marker at 2307. Unusual frequency for this one. (Parker-NY) *My notes indicate that this is a listed frequency for Rijeka Radio-Larry.*
- 12829.5 XFM-Manzanillo Radio, Mexico, with a CW marker at 1647. (Parker-NY)
- 12984.0 VNG-Sydney, NSW, Australia, with AM time signal at 0438. (Anonymous-NE)
- 13077.0 BVA-Taipei Radio, Taiwan, with voice call, "all stations this is BVA with traffic list" at 1300. (Jack Dix-Yonkers, NY)
- 13211.0 SAM 974 working Andrews VIP regarding a 2315 arrival at KONT (Ontario, CA). Communications at 2003. (Jones-CA)
- 13242.0 Postcard working McClellan GHFS at 2015. (Anonymous-NE)
- 13248.0 SAM 26000 working Andrews VIP. Mentioned something about YSCB at 1020 (maybe departure). Heard at 0256. (Jones-CA)
- 13257.0 CanForce 2102 working Trenton military (moved to 15031) at 2031. (Anonymous-NE)
- 13440.0 SAM 26000 working Andrews VIP with block time (didn't catch the airport) at 1640. (Jones-CA)
- 13528.0 C-Single letter HF marker in CW at 1447. (Dix-NY)
- 13960.0 SAM 206 working Andrews VIP with phone patches regarding a 2015 ETA at Dallas/Ft. Worth International (KDFW). Heard at 1830. SAM 202 working Andrews VIP with phone patch to AFOC at 0033. 771 working unid station with phone patch to Toronto Maintenance regarding a new tire needed upon landing. Heard at 2015. SAM 202 checking Andrews VIP here for secondary frequency at 0022. (Jones-CA)
- 14396.5 KHA950-NASA Stennis Space Center, Picayune, MS, with a SHARES net check-in at 1639. Looks like the SHARES program has implemented a weekly (Wednesday) 1600-1700 check-in on 5236.0 and 14396.5. (Metcalf-KY)
- 14531.0 Unid station repeating "1 855 855 855" continuously in CW at 1401. (Dix-NY)
- 14977.0 Unid station sending 5-digit groups in CW at 1407. (Dix-NY) *I have seen OLX-MOI Prague, Czech Republic, on this frequency with that kind of traffic, Jack-Larry.*
- 15011.0 SAM 26000 working Andrews VIP with phone patches and signal checks at 0203. PACOM 01 working Andrews VIP with move to a new primary, told to try F-825 (?) around 0115. SAM 049 and an unid SAM working Andrews VIP on Air Force One's secondary at 0015. (Jones-CA)
- 15043.0 PACOM 01 working Hickam with phone patch to SPAR operations regarding upcoming mods to HF comm gear at 02000. (Jones-CA)
- 16000.0 VNG-Sydney, NSW, Australia, with AM time signal at 0416. (Anonymous-NE)
- 16314.0 English female (British accent) 5-digit number station in AM at 1444 followed by Lincolnshire Poacher tones. (Dix-NY)
- 16950.4 9MB-Penang Naval Radio, Malaysia, with V CW marker at 1249. (Dix-NY)
- 17053.0 XSX-Chilong Radio, China, with CQ CW marker at 1253. (Dix-NY)
- 17064.8 EAD3/EDZ6-Madrid Radio, Spain, with CW marker at 1852. (Parker-NY)
- 18290.0 SAM 50050 working Andrews on F633 at 1910. (Anonymous-NE)
- 18317.0 SAM 683 working Andrews VIP here for new primary, F-623, at 0057. (Jones-CA)
- 18323.0 SAM 683 (DV-2 + 7) ETB MMTM at 0055, working Andrews VIP with phone patch to SAM Command regarding bottle of wine for the DV upon landing at MMTM. The answer was no. (Jones-CA)
- 18437.3 Diplo circulars in Spanish at 1602 using 50 baud RTTY. (Metcalf-KY)
- 19047.0 PACOM 01 working Andrews on F-825 (not confirmed here) with a phone patch at 0205. (Jones-CA)
- 22473.0 CBV-Valparaiso Radio, Chile, with CW marker at 1933. (Parker-NY)

Shortwave Situation Mirrors the World

Unexpected new relay deals have cropped up: Croatia via Germany, Switzerland via Germany, Maryja via Russia, Mexico via Canada and vice versa, another Irish station via WWCR; India is finally looking for a new site to get its signal to; Greece has the right idea, using VOA in the US, but why doesn't Thailand? Meanwhile, one of VOA's Philippine sites is threatened as its Portugal relay is closed down.

Monitor Radio seemed kaput, when a deal fell through for

another Boston publisher to take over the news operation; the unsold shortwave stations went to Plan B, converting to all-religious programming. As does WGTG after flirting with the "patriots."

The military dictatorship in Nigeria faces a second clandestine operation dedicated to its overthrow. Conflict in Congo, Dem. Rep. of Congo, and Sierra Leone made for newsworthy monitoring. Read on...

AUSTRALIA Evidence given at Senate inquiry into RA states at least ten broadcasters had approached RA in the last few years to use its transmitters, including R. Japan and R. Netherlands (Matt Francis, *Australian DX News*)

BOLIVIA R. El Mundo back after many months' silence, 6014.8 weekdays until 0100* (sometimes later for soccer), Saturday until 0200*, Sunday 2400* (Tony Jones, Paraguay, *Cumbre DX*) R. Carlos Palenque, La Paz, 6194.60 at *0903-0930 with folk music (Takayuki Inoue N., Japan)

BRAZIL R. Cultura, São Paulo, 9615.05 with intriguing music from the 30s and 40s, quality audio, from 2300 past 0215 (Jay Novello, NC)

CANADA RCI has signed an agreement with IMER, the Mexican national radio, for RCI programs in Spanish to be broadcast on the IMER network, and RCI will rebroadcast programs from Mexico (RCI news via BBCM) Following the June election, Sheila Copps, who helped find funding to keep RCI alive, retains her post as Heritage Minister, but not Deputy Prime Minister (RCI news via gh) The New Democratic Party, which unexpectedly won a few more seats in the election, opposes CBC funding cuts, unlike the other three (B. Cooley, BC)

Several well-known voices on CBC/RCI called it quits in June, mostly due to drastic budget cuts, though some may still be heard in repeats or in the fall on other programs: Clyde Gilmour, Ian Brown, Vicki Gabereau, Peter Gzowski, Linda Cullen, Bob Robertson, Mary Lou Finlay (gh, from various sources via Cooper, Westenhaber)

RCI heard on subharmonic 4877.5 = 0.5 x 9755 at 2340, as well as 4812.5 = 0.5 x 9625 (Bob Hill, MA, *DSWCI DX Window*)

CHINA A survey of regional stations in April/May found that about 40% of the Chinese SW regional frequencies as compared to *WRTH97* listings have gone inactive, most doubtless replaced by MW and especially FM ... But 45 channels were logged so there are still plenty of DX targets; from 20 of China's 30 regions if you count CRI sites (David Foster, *OzDX*)

COLOMBIA R. Patria Libre heard Mayday on 6250 at 2200 for an hour. Heard very well when it's on, suggesting it is very near the Venezuelan border on the eastern plains of Colombia (Santiago San Gil, Barinas, Venezuela via Jorge García Rangel, Club Diexistas de la Amistad) Also audible here until 2225* (Brian Alexander, PA, *World of Radio*)

CONGO R. Congo, Brazzaville, regular on reactivated 4765 with French around 1800 (Edwin Southwell, England) Following news of coup, checked 4765, but no signal; good instead on 5985.15 at 2100 political announcements in French (Finn Krone, Denmark, *DSWCI DX Window*) RTVC very good on 4765 at *0350-0450+, much weaker at 2120-2130* (Brian Alexander, PA, *World of Radio*)

CONGO D.R. Voix du Zaïre renamed RTNC, Radio-Télévision Nationale Congolaise, also "la voix du peuple" on 15244.5 around 0500-1830 (BBCM) La Voix du Congo, Kinshasa, 15244.51, two days after rebels took over, 1800 until 1916 carrier cut (David M. Clark, Ont., *DSWCI DX Window*) Before the rebel victory, a station they controlled in Butembo, eastern part of the country, was heard on 7060 at 0510 in French and Swahili, drum beats, closed at 0730* (BBCM) V. of the People, 5066, Bunia, formerly R.

*All times UTC; All frequencies kHz; * before hr = sign on, * after hr = sign off; // = parallel program-ming; + = continuing but not monitored; 2 x freq = 2nd harmonic; J-97=May-Sept; Z-97=Summer season; W-97=Winter season; [non] = Broadcast to or for the listed country, but not necessarily originating there.*

CANDIP, expanded schedule to 0400-0800, 1000-1700 (BBCM)

COSTA RICA RFPI has vacated 6205-USB following a complaint of interference to maritime communications from Australian Maritime Safety Authority; replaced with 7585 provisionally at 0000-1200 (RFPI) Rather weak at first, using standby third transmitter, as 7385 and 15050 AM also remained on into the evening, with 15050 holding up as late as 0500 in solstice conditions, often stronger than 7385 and with less noise (gh, OK) 7585 doing quite well here (Joe Hanlon, PA) see also INDIA



Continuous ratchety sound has bothered over most of the 31 meter band for months, caused by someone's maladjusted transmitter. Finally traced it to TIFC on 9645, which is undermodulated. It's most obvious on vacant channels such as around 1200 on 9535, 9590, but strong enough to bother Havana on 9550, and also at 2200. TIFC was begging for donations to fix its equipment, offering to send a brother around to pick up the loot. *Meanwhile they should turn this one off!* -gh, *World of Radio*

CROATIA [non] Deutsche Telekom, Jülich is relaying HRT, Croatian Radio, Zagreb.: 0900-1100 on 9470 to SAM/Au/NZ; 1800-2000 on 9595 to SAF; 0100-0300 9520 to SAM; 0300-0500 9495 to ENAM, to be moved to 49mb in Sept (*BC-DX*) And on new 9520 from 0100 starting with Spanish news (Randy Stewart, MO)

ETHIOPIA R. Ethiopia sent QSL for 0300-0400 on 7110 and undated schedule showing English: National Service, M-F 1030-1100 on 9705, 7110, 5990; External 1600-1700 on 11800, 9560, 7165 (Ed Rausch, NJ)

R. Fana, 6210, *0325-0355+ IS, 0329 ID, exotic vocals, weak here but stronger on //6940 which had RTTY QRM (Brian Alexander, PA)

[non] V. of Oromo Liberation, 1700-1900 Mon/Wed/Sat to ME/Af on 9925 via Ukraine. Address: SBO, PO Box 73247, Washington, DC 20056 (BBCM)

GEORGIA New service mentioned last month from Voice of Hope began regular broadcasts June 4, 100 kW to Asia in English at 120° daily at 1355-1600, produced in England, and QSL reports can be sent to: Voice of Hope, PO Box 109, Hereford HR4 9XR, England; IRC requested for airmail response (HAM)

GREECE [non] In a few months we should be able to transmit from Delano and Greenville (Dionysios Angelogiannis, V. of Greece frequency manager, April 24 via John Babbis) This would be the 1200-1350 broadcast via Delano 9590, heading 75° across the US; gh's crystal ball was working very nicely when *World of Radio* reported last August such a registration. (Babbis, *W.O.R.*) I suspect that

beam is just a reversal of an antenna aimed 255° to the Pacific (gh) VOA engineers confirm this will be the case; some 12 hours a day of VOG will be transmitted from VOA Greenville and Delano, probably by the end of August, as soon as VOG completes installation of a satellite earth station in Greece (Kim Elliott, *VOA Communications World*)

GUATEMALA On 6180, marimba music heard again at 2300 check amid T-storm noise but no Cuba or Brazil QRM: 2307 quick announcements by man and woman seemed to mention "concierto" and "nacional," then off (gh, OK) You're right, it is La Voz de Guatemala, heard with Los Maestros de la Marimba TGW in a *Chapinlandia* program for abroad. Had not been on SW for many a year (Henrik Klemetz, Colombia)

INDIA All India Radio, Gangtok, Sikkim: 0025-0330 on 3390, 0700-0930 on 6085, 1200-1730 on 3390, all 50 kW. Port Blair, Andaman Islands: 0000-0300 on 4760, 0315-0345 & 0700-0850 on 7115, 1030-1630 on 4760, all 20 kW. But Leh is also on 4760 overlapping: 0125-0430 & 1130-1600 with 50 kW; and 0530-1100 on 6000 (Alok Das Gupta, India via Wolfgang Büschel)

AIR External Service sked on 15050, which might conflict with RFPI: 0400-0430 Persian, 0430-0530 Arabic, 0845-0945 Indonesian, 1000-1100 English, all 250 kW from Aligarh; and 1145-1315 Chinese, 250 kW from Delhi. The complex multi-site sked on 10330 for the Vividh Bharati homeservice: 0025-0430 from Bombay 100 kW, Delhi 100, Guwahati 50; plus 0100-0430 Madras 100. 0630-1200 from Bombay, Delhi, Madras. 0630-1730 Guwahati. 1245-1730 all four sites again (*ibid.*) Several broadcasts suspended due to lack of spare parts, including 1000 on 15050 (*DX Grapevine* via *EDXP*)

[non] AIR is going to have a relay station in either West Africa or the West Indies, enabling it to reach the Americas where there is a large concentration of Indians. Negotiations are underway with friendly countries of these areas (Sudipto Ghose, Calcutta, *WRTH* via *DSWCI DX Window*)

IRAN [non] Democratic Voice of Iran, first reported by *World of Radio* (see last month) was subsequently confirmed by BBC Monitoring which reported further info about it: Persian ID is *radio-ye seda-ye azadi-khahan-e iran*, literally "Voice of Iran's Freedom-Seekers," but prefers to be known in English as DVOI. Says it is not affiliated to any particular group, religion, or political faction. Expected to add a second SW frequency in near future (BBCM) Immediately followed at 1800 on 5900 by V. of Russia World Service (Bjorn Fransson, Sweden, *DSWCI DXW*) One day carried V. of Tibet by mistake; must share site (Victor Goonetilleke, Sri Lanka, UADX via *BC-DX*)

IRELAND [non] Emerald Radio Productions had 7-part series via WWCR-3 in June and July, Sun 1900 on 12160, repeat Sat 0800 on 5070. Might be extended. See www.emeraldradio.com (Chuck Adair, WWCR, *World of Radio*)

JAPAN R. Japan cancelled numerous programs, but some elements survive as features within *Hello from Tokyo*, such as *ABC of DXing*, *Japan Diary*, UT Sun 0110-0200 on 5960 via Canada, and several repeats (gh)

KENYA KBC, Nairobi on new 6990 at 1640-1800, booming in, vernacular but good IDs, not /4915, 4934; site? (Bjorn Fransson, Sweden, *DSWCI DX Window*) Also next day 1515-1605 in Swahili request program, ads, 1600 news (Godfrey Clemiston, RSA, *ibid.*) No sign of it around 0300 (gh)

KIRIBATI R. Kiribati, 9810, music at 0620 on both side bands; awful splatter from Cuba-9820 (Volodya Salmani, B.C.)

KOREA SOUTH RKI invited listeners to suggest new name for *Shortwave Feedback* which is now considered outdated; also says it will QSL reports of "reception" via Internet (gh)

LITHUANIA Following a visit by Tibetan exile officials, the Lithuanian Minister of Communications is looking into broadcasting English-language radio programs dedicated to Tibetan independence; also plans to launch Mongolian and Chinese language broadcasts to communicate unbiased info about Tibet to the public in China (Lithuanian Radio via BBCM) [non] After using both 9875 and 9855 for a while via Germany in English at 0030-0100, Vilnius dropped 9875 (Ivan Grishin, Ont.) Had a ham DX program until 0100 UT Tue (George Thurman, TX) *Anyone have a schedule?*

MALTA [non] VOM heard Sunday *1859-2000 in English on 12060 via Russia, /9765 weak (Brian Alexander, PA) VOM to North America in English UT Monday 0100-0200 on 13605 (BBCM) *Not when I checked, heard Golos Rossii instead* (gh, OK, and Randy Stewart, MO)

MÉXICO XERTA, 4800 and 15120 with 5 kW from Ajusco volcano plans to use ten languages, include *Torre DX* program with Julián Santiago (Luis Antero Aguilar via Ruben Guillermo Margenet)

The agreement between IMER and RCI (see *CANADA*) includes a potential program exchange with R. México Internacional. We would broadcast some programs about Mexico in English on some of their frequencies (Juan Mort, XERMX, *W.O.R.*)

Great music and interesting talk segments on a strong signal are available for the insomniac from R. Educación, 6185, which during DST signs off around

1100. One of the *locutoras* doubles in French, but little English is heard (gh, OK) XEQM reactivated on 6104.85 from Mérida at 1115 with music and rapid talk; somewhat distorted but readable on peaks (Jay Novello, NC)

MONACO [and non] TWR on 9745 reported last month is from Albania, 9755 Monte Carlo (David French, World DX Club *Contact*) see also ALBANIA

MYANMAR [non] Democratic Voice of Burma, on SW via Norway, has added Internet RealAudio; daily program uploaded at 1200 on: <http://www.communique.no/dvb/> (BurmaNet News via BBCM)

NIGERIA [non] V. of Free Nigeria was inaugurated June 12 at 0400-0500 on 7180, but then broadcast weekly on Sat at 1900-2000 on 11680; sponsored by the Free Nigeria Movement which calls for boycott of business with Nigeria, and an end to the military dictatorship. Address: P.O. Box 441395, Indianapolis, IN 46244. More info at: <http://pw2.netcom.com/~fnnm/FNM> via rec.radio.shortwave) This appears to be unrelated to the previous clandestine, R. Kudirat.

NORWAY NRK, English Sunday at 1500 said it would replace 11840 with 13805 for WNA (Joe Hanlon, PA)

PERÚ New on SW is R. Huamachuco, 6676.2 at 2330 esoterica, folklore (Henrik Klemetz, Colombia) R. San Ignacio, 7040.8 ex-6997.6 with long adstring 2235; ID at 2253 (Horacio Nigro, Uruguay) 7040.4, R. San Ignacio at 2330 ID (Felipe Asenjo, Chile, *hcdx*)

PHILIPPINES Government has notified US officials that it must close VOA facilities in North Luzon by end of May. Dept. of Foreign Affairs says it wants to convert the 20-hectare property, once a USAF facility, into an ecotourism park (Asian magazine via Hans van den Boogert, *hcdx*) IBB, of which VOA is a part, has no comment about any discussions between the USA and the Philippines about the future of this VOA site. It is still transmitting (Kim Andrew Elliott, VOA) The VOA Poro transmitter is on part of Club John Hay, a former recreational base for US forces, not far from Baguio, the hot weather retreat of the rich. CJH is being redeveloped for the use of the even richer, and the transmitter is in the way, so the Filipinos want it out (John Orford, Philippines, *WDXC Contact*)

PBS, Radyo Pilipinas, English at 0230-0330 on 11885, 15120, 15270 Mon-Sat starts with *Voice of Democracy*, ends with *World News*; in between: Mon, *Save the Earth*; Tue, *The Phils. Today*; Wed, *Our Changing World*; Thu, *Business Updates*; Fri, *Brotherhood of Men*; Sat, *Listeners & Friends*; Sun: *Deutsche Welle*, *Sports Focus*, *News Round-Up* (PBS)

R. Mindoro, religious, active again on 3345.5v, fade-in at 0840 (Roland Schulze, Philippines, *BC-DX*) From the hill above the Mangyan Bible School; on air three times a week, Wed and Sat mornings, Sun afternoons, totalling 6 hpw, has to use a diesel generator, since hydro station was destroyed in 1993 typhoons (John Richards, Mindoro via H. J. Biener, *Kirche in Rundfunk* via *BC-DX*)

R. Veritas Asia, Filipino at 1500-1525 (-1555 Wed, Fri, Sun) on 9680 ex-11715/9540 (*Pan/view*, Bulgaria via *BC-DX*) Used to include some English segments; and "Filipino" includes English, Spanish words (gh)

PORTUGAL RARET, the Portuguese company relaying RFE/RL/VOA at Glória and Maxoqueira is about to close down, as Glória is inoperative since 1996 and Max is being dismantled, said to be moving to Tinian island for R. Free Asia. Some of the oldest transmitters at Glória belong to the Portuguese state and will be returned (Carlos L. Relvas Assunção Gonçalves, *DSWCI SW News* via *EDXP*)

SIERRA LEONE SLBS, 3316, on extended schedule after military takeover, mostly non-stop music, but at 0102 anthem and message from military commander (John Ekwall, Sweden, *Cumbre DX*)

SOUTH AFRICA World Music Radio, Sat and Sun 1800-2200 uses 6290 with 250 kW, 21 dBi gain, 342° and 3345 with 100 kW, 12 dBi gain, 5°. If it becomes popular, tentative date for expanding to a daily service is Nov 1 (Stig Hartvig



DX Listening Digest

More broadcasting information by country compiled by Glenn Hauser

Review of International Broadcasting

SW Programming, opinion, equipment, satellite monitoring.

Samples \$2.50 each (outside North America US \$3 or 6 IRCs)

10 issue subscriptions \$26 in USA, or both for \$49

Glenn Hauser, Box 1684-MT, Enid, OK 73702

Nielsen, WMR, Denmark)

The Investment Channel had a two-year contract with SENTECH but it was terminated after only seven weeks by Jerry Hoffman. He said they had tremendous response from Africa but phones and faxes do not work well and it takes six weeks for a letter to reach Atlanta from Africa. It would take almost four months just to establish what a listener really wants (Rodgers Gamuti, SENTECH via Hans Johnson, *Cumbre DX*)

SWITZERLAND [non] One of the many SRI transmissions on 13635 is shown as relay via Jülich, Germany: 1645-1830 to Eaf, no English (Swiss Telecom via Bob Padula, *EDXP*) 100 kW whilst all the Swiss transmitters are more (gh)

TAIWAN The government has decided to establish a single overseas service by merging Voice of Free China and Central Broadcasting Station in July. Expected to be called Central Broadcasting System (*WRTH* via *Electronic DX Press*)

THAILAND R. Thailand, new 15370 with two different English programs at 0030, 0300, Thai in between and after 0330, very strong (Hans van den Boogert, Taiwan, *DSWCI DX Window*) *Actually North American service via Udorn: occasional traces of it here. When will they catch on like the Greeks that they can use VOA USA sites? (gh)*

TIMOR EAST [non] Indonesian authorities are arresting and persecuting people caught listening to RDP International, Lisbon, on SW (RDP via BBCM)

UK & GABRIEL R. Free London, pirate with 40 watts according to E-mail QSL, heard on new 5804.7 at 0435-0500+ on a UT Sunday, weak but readable on peaks with rock music, announcements (Paul Ormandy, New Zealand and via *The Four Winds*) *Quite a catch! KAIJ-5810 a problem here (gh)*

USA Sale prices for SW stations: WRMI, \$850K; WVHA, \$5M; WSHB, World Class Station with two transmitters, \$13M (George Jacobs & Associates website) *What about KHBI Saipan? Not mentioned. Does this mean it's already sold, maybe to R. Free Asia? (gh)*

By late May, WVHA's Sabbath live service was missing, replaced by recorded programs 1330-1530 on 17535. Does this mean Prophecy Countdown's financial situation is so bad they can no longer afford satellite time, and WVHA's days are numbered? (Jim Moats, OH, *World of Radio*)

In early June, Monitor Radio reached a tentative agreement for World Times, Inc., to become its successor in producing radio news programming. World Times, also based in Boston, publishes the weekly newspaper supplement *WorldPaper* in six languages, only for distribution abroad. See www.worldpaper.com (Sue Schardt, Monitor Radio via C. Ed Evans, WSHB) This was contingent upon a sufficient number of affiliates agreeing to carry the program, and upon outside funding (Jerry Ackerman, Boston *Globe* via Mike Cooper) But BBC is greatly expanding its news operation, including the replacement for Monitor Radio at 5 a.m. ET via 500 U.S. public radio stations (William D. Montalbano, Los Angeles *Times* via Mike Cooper) *WorldPaper* deal fell through, as too many stations had already made other binding arrangements, so Monitor Radio is finished (Reuter, AP, Boston *Globe*, Miami *Herald* via Mike Cooper, David Alpert, Jim Moats, Peter Tatiner, Aaron Pilchick)

Throughout June, WSHB was announcing at :36 past every hour that from June 28 it would convert to all-religious format daily in seven languages (Ken Mason, Jim Moats, *W.O.R.*) *Ergo, no buyer found yet, as this was their backup plan (gh)* KHBI also was to go all-religious (C. Ed Evans, WSHB)

The owner and founder of WRNO has died in his mid-fifties. Joe Costello had a colorful and controversial broadcast career over the past fifteen years (Rachel Baughn, ed.) Costello's family is expected to put the station up for sale shortly (Paul Rusling, British DX Club *Communication*) In his written will, Joe Costello left the station to Loyola University. But on his deathbed he verbally left it to the archbishop. Whether WRNO will be kept or sold, who knows? For sure if kept by archbishop, anti-Catholic and similar programming unlikely to continue (George Jacobs via Larry Magne via Marie Lamb, *Cumbre DX*) In mid-June, WRNO was still on 7395 until 2300 with music tapes not matching outdated website sked, continuity tapes by Costello as if he were still in charge—(*hm-mm, it is New Orleans, after all*)—then went to 7355 (gh) E-mail allegedly from Costello a month after he allegedly died said work was progressing slowly on transmitter for 15420 (via Orrin Edwards, *rec.radio.shortwave* via Jim Moats)

DXing with Cumbre added new times: Sat 1130 on 9930, Sun 2130 on 9495 (*DWC*) But old times no longer mentioned aren't always deleted (gh)

WEWN Z-97 schedule shows two 500 kW transmitters doubled on same frequency at times with different antennas: 6890 at 0000-0800, 7425 at 0800-1300 (via *BC-DX*)

The two neighbors who have caused trouble for WGTG refused my offer to help them fix interference problems. Besides second transmitter, CP for more antennas, rhombics and yagis, with a new rhombic aimed 340° ready to go. After building an audience with "New World Order baloney," WGTG planned to cancel "patriot" programming from Amerinet, and expand Fundamental Broadcasting Network in July: FBN might lease the entire station in keeping with our original goal of salvation. In the middle of a city, Macon [see next item-ed.] is likely to have even more complaints from neighbors (David Frantz, WGTG, *World of Radio*)

Charles Josey says the call letters WWBS he wanted for his new Macon, Georgia, SW station do not stand for anything in particular. He will retire in November and devote full time to building his station. A four element yagi cut precisely for 11910 kHz, the only frequency planned to be used at first, will be placed atop an old electric pole on top of a downtown building. Transmitter uses parts from a WWCR unit badly damaged by fire a few years ago (Kim Elliott, VOA *Communications World*)

Ham Radio and More has changed format and airs exclusively on WWCR, live Sun 220 (top of hour, no more news) on 5070, repeated Tue 0800 on 3210, Sun 0500 on 5070 (Len Winkler, *HR&M* via *rec.radio.shortwave*) The KFNN studio and network of AM stations are no longer involved. WWCR unexpectedly reduced the Brother Stair schedule in June on 2390 to 0500-1200, with 7435 expanded to 2200-0500 (gh)

VOA has added 15135 from Greenville at 1700-1800, including *Communications World* at 1730 Sat (Edwin Southwell, England) Helps in the Americas although too close to HCJB powerhouse on 15140—why not use 15580? Also contains *Talk to America* call-in at 1706 weekdays (gh) See also GREECE, PHILIPPINES, THAILAND

VOA conducted more digital SW tests from Delano on 17895, 13730, to evaluate the JPL system (VOA *CW*) Sound is tinny, less rich than local AM, but software to receive may be available within two years (Kim Elliott, VOA, *RNMW*)

The Clinton Administration is considering naming a new chairman of the advisory board for broadcasting to Cuba, Elena Diaz-Verson Amos, Democrat from Georgia. She would replace Jorge Mas Canosa who would become chairman emeritus with little power. A representative of the Cuban American National Foundation said Mas would fight the ouster (Christopher Marquis, Miami *Herald* via Aaron Pilchick)

R. Liberty has new interval signal, music bed with people of all types, including kids giving both RFE and RL IDs in many languages, heard at 1458 on 11725 via Wooferton before Belarussian program (Jay Novello, NC) RFE has a new president, Thomas A Dine, former AID administrator, moving to Prague HQ (Washington *Post* via Chet Copeland)

The Supreme Court let stand a ruling that the US Information Agency discriminated against women in hiring, and that its treatment as a class-action lawsuit was valid (AP via Mike Cooper)

The Powder Springs, GA, FCC monitoring station is being investigated for prohibited personnel practices. A former employee charges minorities have never been hired and nepotism takes precedence over veterans' preference (Solutions, Ltd., *rec.radio.shortwave*)

VENEZUELA R. Nacional, 9540, an almost forgotten station, heard May 31 at 2140-2211+ in Spanish, no French or English as previously scheduled; fair signal (Jay Novello, NC, *World of Radio*) This was the day it reactivated, featured folk music (Jorge García Rangel, Venezuela) Mostly inaudible here subsequently (gh, OK)

Currently inactive are stations on 4770, 4780, 4840—irregular, 4970, 5030, 5040, 6010; on the air is Ecos del Torbes, 4980 and 9640, mornings until 1400 and 1800-0400 including R. Rumbos news relays. The latter station may be QSLed via Torbes relay (Jorge García, Venezuela, *Cumbre DX*)

R. Amazonas, 4940, will be verified with its own card if report sent with return postage and stickers from local stations to R. Continental's Francisco José Ocano, Urb. 23 de Enero, Calle Nicolás Briceño, No. 18-266, Barinas 5201-A (Ed Rausch, NJ)

VIETNAM Yên Bái provincial service on 6541.4v at 1030-1158°, ID with traditional music, 1130 tribal songsong; Lai Chau on 6396.7v 1130 similar music to 1200°, many IDs (Mike Ryan, Thailand)

ZIMBABWE Radio 4, which is on SW, is being privatized, sold off to a new company (Zimbabwe *Independent* online via Andy Sennitt, RN *Media Network*)

Until the Next, Best of DX and 73 de Glenn!!

<http://idit.net/~khecht19/ghauser>

Gayle Van Horn

- 0000 UTC on 9550**
UKRAINE: Radio Ukraine Int'l. Evening service to North America with national news, IDs and music. // 7150. (Lee Silvi, Mentor, OH/via email; Sue Wilden, Columbus, IN/via email) *Ukraine Today* heard on 9550 at 0315. (Howard J. Moser, Lincolnshire, IL)
- 0004 UTC on 4925**
INDONESIA: RRI Jambi (Sumatra). News text format in Indonesian. RRI-Fak Fak (Irian Jaya) on 3646 at 1915-1940 with text and intermittent signal interference. RRI-Merauke (Irian Jaya) in Arabic on 3905, 1947-1955*. (Mahendra Vaghjee, Rose Hill, Mauritius)
- 0020 UTC on 9710**
MALI: China Radio Int'l. Report on solar electricity for rural areas. (Bob Fraser, Cohasset, MA)
- 0115 UTC on 9905**
SWITZERLAND: Swiss Radio Int'l. *Newsdesk* program. (Wilden, IN) Station noted on 9905 at 0402. (Brookman, AK)
- 0236 UTC on 7160**
ALBANIA: Radio Tirana. English service to North America with news from Albania and the Balkan's region. Vocal pop music by lady singer to 0254, // 6140 with moderate static and minimal fading. (Stokes Schwartz, Madison, WI/via email; Gerald R. Brookman, Kenai, AK)
- 0248 UTC on 11910**
HUNGARY: Radio Budapest. Music of Franz List with commentary. Email address and closing announcements at 0258 to 0300*. (Wilden, IN)
- 0300 UTC on 6095**
VATICAN STATE: Vatican Radio. Feature on the church in Czechoslovakia-Czech Republic during the last 50 years. Light static and interference from Deutsche Welle on 6100. Noted on // 7305 with heavy static. (Schwartz, WI)
- 0300 UTC on 15115**
NEW ZEALAND: Radio New Zealand Int'l. Newstalk program on golfing. Great signal to fadeout at 0344. (Silvi, OH) Programming noted on 15115 to 0400. (Wilden, IN) New Zealand's *Kiwi Radio* on 7475 USB, 0717-0830. (Silvi, OH)
- 0305 UTC on 7300**
TURKEY: Voice of Turkey. News from the Turkish press to folk music. (Moser, IL) VOT noted on 13695 at 1920. (Wilden, IN)
- 0320 UTC on 4845**
BRAZIL: Meteorologia Paulista. Brazilian music to ID and listener phone-in calls. Brazil's Radio Aparecida noted on 5035, 0230-0245 with ads, jingles, and religious text format. (Vaghjee, MAU)
- 0335 UTC on 7520**
MOLDOVA: Radio Moldova Int'l. Newscast and commentary segment. ID's at 0336 and 0352, with frequency schedule given. Intervals of fine jazz music. (Schwartz, WI)
- 0811 UTC on 9633.98**
MALI: RTV Malienne. Afro music to vernacular text. Heard weakly with French news at 1301. Noted this frequency at 1252-1316 & 1552-1600. (Mark Veldhuis, Borne, The Netherlands/Hard-Core-DX)
- 1135 UTC on 15240**
SWEDEN: Radio Sweden. Report on economy and European Monetary Union. (Moser, IL) Report on canal boat cruises at 1345 on 15240. (Fraser, MA)
- 1140 UTC on 9580**
AUSTRALIA: Radio Australia. *Business Week* discussing Mitsubishi investment in auto industry, and Pakistan returns to favor with international bankers. (Fraser, MA) Noted on 9860 at 1321. (Wilden, IN)
- 1145 UTC on 6120**
CANADA: Radio Japan relay. Japan celebrates *Children's Day*. (Fraser, MA)
- 1450 UTC on 3232**
INDONESIA: RRI Bukittin (Sumatra). Regional music to newscast at 1500 and music program. Indo's *RRI-Bengkul* (Sumatra) on 3265 at 1506 with talk and ID. *RRI-Ujung* (Kalimantan) on 4754 at 1545. (Vaghjee, MAU)
- 1215 UTC on 13805**
NORWAY: Radio Norway Int'l. Nordic Report on the economies of Norway, Finland, and Sweden. (Fraser, MA)
- 1225 UTC on 13625**
FRENCH GUIANA: Radio France Int'l. *Asia File* program on the Freedom Movement in Indonesia. (Fraser, MA)
- 1404 UTC on 9560.2**
ETHIOPIA: Radio Ethiopia. Arabic talk, music, ID and news mentions of Addis Ababa. SINPO=32432. (Veldhuis, NLD)
- 1503 UTC on 11840**
DENMARK: Radio Denmark. Danish text to *Green Green Grass of Hometune*. Danish folk tune to station ID 1530. (Moser, IL)
- 1540 UTC on 7120**
CHAD: Radiodiffusion Nat'l Tchadienne. Native music to vernacular talk. Drum internal signal, IDs, and frequencies in French. Repeat interval signal to sign-off. (Veldhuis, NLD)
- 1605 UTC on 17750**
USA: WYFR. Piano music and *Christ Centered* program. (Wilden, IN)
- 1645 UTC on 15460**
FRANCE: Radio France Int'l. National and world news to letters from listeners. (Brookman, AK; Moser, IL)
- 1701 UTC on 11775**
ANGUILLA: Caribbean Beacon. Dr. Gene Scott's University Network programming. (Wilden, IN)
- 1825 UTC on 3210**
MOZAMBIQUE: Emissao National. Portuguese. Report on parliament to commercials and "Radio Mozambique" ID. Carnival music to time pips and news intro as, "noticia internacional." Noted also on 9619, 0635-0700. (Vaghjee, MAU)
- 1830 UTC on 11990**
KUWAIT: Radio Kuwait. Twelve minutes of news into western easy listening music. (Fraser, MA) Kuwait noted on 15505 at 1930. (Wilden, IN)
- 1855 UTC on 15315**
NETHERLANDS ANTILLES: Radio Netherlands Bonaire relay. *Siren Song* with tribute and interview with Pete Myers. (Fraser, MA)
- 1855 UTC on 5800**
TAJIKISTAN: Radio Tajikistan. Regional music to newscast. Clear station ID to poem by Zabrakhan closing program segment, anthem to 1900*. (Vaghjee, MAU)
- 1900 UTC on 12015**
ECUADOR: HCJB. News and *Studio 9* show on environmental issues. (Fraser, MA) Discussion on leadership issues at 1552 on 15115. (Wilden, IN)
- 1900 UTC on 9435**
ISRAEL: Kol Israel. *Holocaust Remembrance Day* discussed. (Fraser, MA)
- 1915 UTC on 11720**
BULGARIA: Radio Bulgaria. English service to Europe with program *Events & Developments*, hosted by lady announcer. Light static and fading for overall decent signal. (Schwartz, WI)
- 1925 UTC on 15430**
RUSSIA: Voice of Russia WS. Report on Russian explorer Georgi Sedov and his death while trying to reach the North Pole in 1914. (Fraser, MA)
- 1935 UTC on 11804.9**
BRAZIL: Radio Globo. Portuguese talk and news of Rio de Janeiro. Sports report with sound effects and "Globo" identification. (Veldhuis, NLD) Brazil's *Radio Nacional de Amazonia* on 11780 at 1951-2027, broadcasting from Brasilia. Portuguese sports report to ID. SINPO=34434. (Veldhuis, NLD)
- 1945 UTC on 9895**
NETHERLANDS: Radio Netherlands. *Sincerely Yours* mailbag program. (Fraser, MA)
- 2000 UTC on 7170**
GERMANY: Deutsche Welle. Report on the economy-with no cuts in aid to eastern Germany. (Fraser, MA) German service on 11980 at 1550. (Moser, IL) and 17810 at 2008. (Wilden, IN)
- 2012 UTC on 9680**
THAILAND: Radio Thailand. English ID and preview of upcoming French programming at 2013. (Veldhuis, NLD)
- 2030 UTC on 9965**
ARMENIA: Voice of Armenia. English to Europe monitored to 2100. Spanish noted 2100-2115*. (Silvi, OH)
- 2037 UTC on 6055**
RWANDA: Radio Rwanda. English talk to pop music, including George Michael's *Faith* tune. Multilingual IDs in vernaculars, French and English. (Veldhuis, NLD)
- 2220 UTC on 9721.6**
PERU: Radio Victoria. Spanish. Singing children's chorus to announcer's chat to ID and talk of Lima. (Veldhuis, NLD)
- 2220 UTC on 11775**
SPAIN: Radio Exterior Espana. Music program on Spanish composers. (Brookman, AK)
- 2327 UTC on 4790**
PERU: Radio Atlantida. Coca-Cola commercial to ID, informative health program discussing malaria. (Veldhuis, NLD) Peru's Radio *Los Andes* on 5030, 1000. (Jose Hauser, Newaygo, MI/via email)
- 2330 on 7040.4**
PERU: Radio San Ignacio. Spanish. Local evening greetings to Peruvian folk music. "Esta transmitiendo Radio San Ignacio, Avenida Libertador 751." Station is located in Cajamarca Department bordering with Ecuador. (Felipe Aserjo/Hard-Core-DX)

Thanks to our contributors — Have you sent in YOUR logs?
Send to **Gayle Van Horn**, c/o Monitoring Times (or e-mail gayle@grove.net)
English broadcast unless otherwise noted.

Kudos to YLE!

YLE Radio Finland, the international radio service of the Finnish Broadcasting Company, is now offering full data QSL cards for correct reception reports! That is great news to hobbyists who have struggled for years with YLE's non-QSL policy. Reports may be sent to: P1 78, Fin-00024 Helsinki, Finland. For schedules, RealAudio, and more, go to YLE's website: <http://www.yle.fi/fbc/radiofin.html>



World Harvest Radio will confirm your report for RealAudio transmissions via their website. Frequencies, schedules, RealAudio from *DXing with Cumbre* and other World Harvest programs are also available at: <http://www.whri.com> or <http://www.kwhr.com> For written and taped reception reports: World Harvest Radio, P.O. Box 12, South Bend, IN 46624.

ALASKA

HAARP (High Frequency Active Auroral Research Program). Report for CW test transmission on March 8, 1997, 6990 kHz. Full data QSL card with a photo of antenna facility, signed by "Michelle." Received in 36 days for an English utility report and mint postage (used on reply). Station address: P.O. Box 271, Gakona, AK 99573 (Randy Stewart, Springfield, MO) *For country counting, Alaska is considered a separate country-ed.*

ARMENIA

Voice of Armenia, 9965 kHz. Full data blue folder card unsigned. Received in 45 days for an English report. Station address: Alek Manukian 5, Yerevan 25, Republic of Armenia. (Mahendra Vaghjee, Rose Hill, Mauritius)

CHILE

Radio Esperanza, 6090 kHz. Full data QSL folder card, along with picture postcard of Chilean mountains, plus personal letter in Spanish from Ramon P. Woerner K.-Director. Received in 22 days for a Spanish report and two IRCs. Station address: Casilla 830, Temuco, Chile. (Stewart, MO) Full data card received in 200 days, signed by Eleazar H. Jara. (G. Brown, Scotland, U.K./*The Four Winds*)

COASTAL RADIO

JFM-Muroto Fisheries Radio, 8508 kHz. Full data prepared QSL verified for a utility report in 38 days. Station address: 2318 Furushiro Murotsu Murotsu-city, Kochi-Prefecture, Japan. (Steve McDonald, Port Coquitlam BC, Canada)

JFG-Shizuokaken Fisheries Radio, 12811 kHz. Full data prepared QSL card verified plus photos for a utility report in 20 days. Station address: Shizuokaken Musen (Gyokyo), 1991-1 Tajiri, Yaizu-Shizuokaken-ken, 425, Japan. (McDonald, CAN)

JFZ-Kushiro Fisheries Radio, 16942.8 kHz. Full data prepared QSL card verified plus photos for a utility report in 37 days. Station address: 1-5-15 Yonemachi, Kushiro-city, Hokkaido 085, Japan. (McDonald, CAN)

JFC-Misaki Fisheries Radio, 12832.5 kHz. Full data prepared QSL card verified for a utility report in 36 days. Station address: 1-7 Harumi Miura, Japan 23802. (McDonald, CAN)

FINLAND

YLE/Radio Finland, 15400 kHz. Full data QSL card with aerial photo of coastline, stamped with station seal and initialed "MJ." Received in 29 days for an English report and one IRC to Pori transmitter site. Station address: Finnish Broadcasting Co., Short Wave Centre, Previki, FIN-28660, Pori, Finland. (Stewart, MO)

MEDIUM WAVE

WBBM, 780 kHz. Full data QSL letter signed by Mark Williams and station info sheet. Received in 22 days for an English AM report. Station address: 530 North McClure, Chicago, IL 60611. (Jose Moura, Washington, DC)

WLS, 890 kHz. Full data QSL letter signed by Warren Shulz and station info sheet. Received in 45 days for an English AM report. Station address: 190 North Street, Chicago, IL 60601. (Moura, DC)

NIGERIA

Radio Kudirat Nigeria, 6205 kHz. Full data verification letter with illegible signature. Received in 54 days for an English report, two U.S. dollars, SASE (unused for reply) and souvenir postcards. Station address: P.O. Box 9663, London SE1 3ZD United Kingdom. (Gayle Van Horn, Brasstown, NC)

FRCN/Radio Nigeria-Ibadan, 6050 kHz. Full data station card signed by Dare Folarin-Principal Public Affairs Officer. Received in 360 days for an English report and two U.S. dollars. Station address: P.M.B. 5003, Ibadan, Nigeria. (Sam Wright, Biloxi, MS) Now that Voice of Nigeria has reactivated, send your report and return postage to: P.M.B. 40003 Falomo Post Office, Ikoyi, Lagos, Nigeria. Refer to *MT's* Shortwave Guide beginning at 0500 UTC.-ed.

NORTHERN MARIANA ISLANDS

Radio Free Asia, 13800 kHz. No data verification on station letterhead. Letter did contain background information on Radio Free Asia. Received in 90 days for an English report. Station address: 2025 M Street NW-Suite 300, Washington, DC 20036. (Darren White, Hattiesburg, MS)

SHIP TRAFFIC

M/V Zenovia EKMP6, 590 kHz (Bulk Carrier). Full data prepared QSL card verified and personal letter. Received for an English utility report and return mint postage. Ship address: c/o Colonial Navigation Co., Inc., 750 Lexington Avenue, 26th Floor, 59th Street, New York, NY 10022. (Holbrook, MD)

Cape Trinity KAFD, 500 kHz (Roll-On/Roll-Off). Full data prepared QSL card verified. Received for an English utility report and return postage. Ship address: Maritime Administration, MAR 745, Room 2126, 400 7th Street, SW, Washington, DC 20590. (Holbrook, MD)

SATELLITE SERVICES

Polskie Radio 5 via World Radio One. C-band satellite service-domestic satellite Galaxy 5/transponder 6, audio subcarrier 6.80 MHz. Full data station logo card unsigned, plus souvenir postcards, program schedule, friendly letter from Rafal Kiepuszewski-English Service Director, and a Radio Warsaw T-shirt won by lottery. Received in 42 days for details of broadcast via satellite on WRN. Station address: c/o English Language Service, P.O. Box 46, 00-977 Warsaw, Poland. (Van Horn, NC)

SINGAPORE

Radio Singapore International, 6015 kHz. Full data *Singapore's National Day Parade Card*, unsigned, plus personal letter from Sakuntala Gupta-Program Manager. Received in 65 days for an English report. Station address: Farrer Road, P.O. Box 5300, Singapore 912899. (Vaghjee, MAU) URL: <http://www.rsi.com.sg.8000/rsi/>.

SOUTH AFRICA

Radio Oranje-via SABC, 3230 kHz. Full data yellow logo card unsigned. Received for an English report and return postage. Station address: P.O. Box 7117, Bloemfontein, 9300 Republic of South Africa. (Vaghjee, MAU) SABC's URL: <http://www.sabc.co.za>.

STANDARD FREQ/TIME SIGNAL STATION

WWVH 15000 kHz. Full data verification on station letterhead signed by Dean T. Okayama-Engineer in Chief. Station booklet and color folder QSL card enclosed. Received in 35 days for an English report and return mint postage. Station address: P.O. Box 417, Kekaha, Kauai, HI 96752. (Tom Banks, Dallas, TX) *This station may be counted as Hawaii-ed.*

ZAMBIA

Radio Christian Voice, 3330 kHz. Date only QSL form letter with illegible signature. Received in 56 days for an English follow up report and one U.S. dollar. Station address: Private Bag E606, Lusaka, Zambia. Email: voice@zamnet.zm

How to Use the SHORTWAVE GUIDE.

1: Convert your time to UTC.

Eastern and Pacific Times are already converted to Coordinated Universal Time (UTC) at the top of each page. The rule is: convert your local time to 24-hour format; add (during Daylight Savings Time) 4, 5, 6, or 7 hours for Eastern, Central, Mountain or Pacific Times, respectively.

Note that all dates, as well as times, are in UTC; for example, a show which might air at 0030 UTC Sunday will be heard on Saturday evening in America (8:30 pm Eastern, 5:30 pm Pacific).

2: Choose a program or station you want to hear.

Some selected programs appear on the lower half of the page for prime listening hours—space does not permit 24-hour listings.

Occasionally program listings will be followed by "See X 0000." This information indicates that the program is a rerun, and refers to a previous summary of the program's content. The letter stands for a day of the week, as indicated below, and the four digits represent a time in UTC.

S: Sunday T: Tuesday H: Thursday A: Saturday
M: Monday W: Wednesday F: Friday

3: Find the frequencies for the program or station you want to hear.

Look at the page which corresponds to the time you will be listening. Comprehensive frequency information for English broadcasts can be found at the top half of the page. All frequencies are in kHz.

The frequency listing uses the same day codes as the program listings; if a broadcast is not daily, those day codes will appear before the

station name. Irregular broadcasts are indicated "tent" and programming which includes languages besides English are coded "vl" (various languages).

4: Choose the most promising frequencies for the time, location and conditions.

Not all stations can be heard and none all the time on all frequencies. To help you find the most promising frequency, we've included information on the target area of each broadcast. Frequencies beamed toward your area will generally be easier to hear than those beamed elsewhere, even though the latter will often still be audible. Every frequency is followed by one of these target codes:

am: The Americas	as: Asia
na: North America	au: Australia
ca: Central America	pa: Pacific
sa: South America	va: various
eu: Europe	do: domestic broadcast
af: Africa	om: omnidirectional
me: Middle East	

Consult the propagation charts. To further help you find the right frequency, we've included charts at the back of this section which take into account conditions affecting the audibility of shortwave broadcasts. Simply pick out the region in which you live and find the chart for the region in which the station you want to hear is located. The chart indicates the optimum frequencies for a given time in UTC.

RADIO PROGRAMS.

COMPILED BY JIM FRIMMEL

Sundays

0027 Radio Exterior de Espana: "Distance Unknown"
0109 HCJB (am): "DX Partyline"
0127 Radio Exterior de Espana: "Distance Unknown"
0200 WWCR #3 (Tennessee): "Spectrum"
0200 Radio For Peace Intl: "World of Radio"
0234 Radio Havana Cuba: "DXers Unlimited"
0249 Radio Romania Intl: "DX Mailbag"
0258 Vatican Radio: "On-the-Air"
0315 Voice of Turkey: "DX Corner (biweekly)"
0330 WHRI (Angel 2): "DXing with Cumbre"
0409 HCJB (am): "DX Partyline"
0410 Australia, Radio: "Feedback"
0430 Australia, Radio: "The Media Report"
0434 Radio Havana Cuba: "DXers Unlimited"
0505 WWCR #3: "Ham Radio and More"
0508 Vatican Radio: "On-the-Air"
0527 Radio Exterior de Espana: "Distance Unknown"
0610 Australia, Radio: "Feedback"
0634 Radio Havana Cuba: "DXers Unlimited"
0635 Radio Vlaanderen Intl: "Radio World"
0830 Radio Korea: "Shortwave Feedback"
0900 Radio For Peace Intl: "World of Radio"
0900 WWCR #1 (Tennessee): "World of Radio"
0905 Radio Vlaanderen Intl: "Radio World"
0905 BBC (af): "Write On"
0910 Australia, Radio: "Feedback"
0930 Australia, Radio: "The Media Report"
1040 Radio Korea: "Shortwave Feedback"
1100 AWR Latin America: "Wavescan"
1205 BBC (am/eur/as): "Write On"
1215 Radio Bulgaria: "Radio Bulgaria Calling"
1215 WRMI (Florida): "Wavescan"
1230 Radio Korea: "Shortwave Feedback"
1235 Radio Vlaanderen Intl: "Radio World"
1240 Radio Korea: "Shortwave Feedback"
1352 Vatican Radio: "On-the-Air"
1501 BBC (af/as): "Waveguide"
1630 Radio Korea: "Shortwave Feedback"
1705 BBC (as): "Write On"
1805 Radio Vlaanderen Intl: "Radio World"
1830 KWHR (Hawaii): "DXing with Cumbre"
1930 Radio Korea: "Shortwave Feedback"
1940 Radio Korea: "Shortwave Feedback"

2010 Radio Korea: "Shortwave Feedback"
2015 WRMI (Florida): "Wavescan"
2100 AWR-Europe (Slovakia): "Wavescan"
2105 Radio Vlaanderen Intl: "Radio World"
2105 BBC (am/eur/as): "Write On"
2113 Radio Budapest Intl: "Radio Budapest DX Show"
2130 Radio Korea: "Shortwave Feedback"
2135 BBC (af): "Write On"
2145 Radio Bulgaria: "Radio Bulgaria Calling"
2200 WHRI (Angel 2): "DXing with Cumbre"
2200 WWCR #3: "Ham Radio and More"
2230 Radio Canada Intl: "Now the Details"
2300 AWR Latin America: "DXing with Cumbre"
2300 KSDA (Guam): "Wavescan"
2300 Radio For Peace Intl: "World of Radio"
2315 WWCR #3 (Tennessee): "Ask WWCR"
2330 Radio Bulgaria: "Radio Bulgaria Calling"
2330 WWCR #3 (Tennessee): "World of Radio"
2335 Radio Vlaanderen Intl: "Radio World"

Mondays

0000 WRMI (Florida): "Wavescan"
0230 Radio Korea: "Shortwave Feedback"
0231 Radio Canada Intl: "Now the Details"
0245 Radio Budapest Intl: "Radio Budapest DX Show"
0305 BBC (am/eur/af): "Write On"
0330 KWHR (Hawaii): "DXing with Cumbre"
0430 Radio New Zealand Intl: "Mailbox (biweekly)"
0445 Radio Bulgaria: "Radio Bulgaria Calling"
0500 WWCR #3 (Tennessee): "Ask WWCR"
0700 Radio For Peace Intl: "World of Radio"
0730 BBC (af): "Waveguide"
0805 WWCR #1 (Tennessee): "Spectrum"
1040 All India Radio: "DX-ers Corner (2/4)"
1350 Radio Romania Intl: "For Radio Amateurs"
1520 Radio Romania Intl: "For Radio Amateurs"
1615 KTWI (Guam): "Pacific DX Report"
1815 Radio Tallinn: "Radio Estonia DX Program"
1840 All India Radio: "DX-ers Corner (2/4)"
1950 Radio Romania Intl: "For Radio Amateurs"
2100 WWCR #1 (Tennessee): "Ask WWCR"
2130 All India Radio: "DX-ers Corner (2/4)"
2150 Radio Romania Intl: "For Radio Amateurs"
2350 Radio Romania Intl: "For Radio Amateurs"

Tuesdays

0245 WRMI (Florida): "Wavescan"
0255 Radio Romania Intl: "For Radio Amateurs"
0800 WWCR #1: "Ham Radio and More"
0900 KTWI (Guam): "Pacific DX Report"
1146 Radio Sweden: "MediaScan (1/3)"
1210 AWR Latin America: "Wavescan"
1230 WWCR #1 (Tennessee): "World of Radio"
1246 Radio Sweden: "MediaScan (1/3)"
1330 WRMI (Florida): "Wavescan"
1346 Radio Sweden: "MediaScan (1/3)"
1355 FEBC (Philippines): "DX Dial"
1730 BBC (am/eur): "Waveguide"
1746 Radio Sweden: "MediaScan (1/3)"
1900 Radio For Peace Intl: "World of Radio"
1946 Radio Sweden: "MediaScan (1/3)"
1950 Polish Radio: "Polish Radio DX Club"
2109 Radio Havana Cuba: "DXers Unlimited"
2309 Radio Havana Cuba: "DXers Unlimited"
2340 All India Radio: "DX-ers Corner (2/4)"

Wednesdays

0135 Radio Havana Cuba: "DXers Unlimited"
0146 Radio Sweden: "MediaScan (1/3)"
0245 WRMI (Florida): "Wavescan"
0246 Radio Sweden: "MediaScan (1/3)"
0300 Radio For Peace Intl: "World of Radio"
0335 Radio Havana Cuba: "DXers Unlimited"
0345 BBC (as): "Waveguide"
0346 Radio Sweden: "MediaScan (1/3)"
0535 Radio Havana Cuba: "DXers Unlimited"
0830 HCJB (eu): "Ham Radio Today"
0930 HCJB (pac): "Ham Radio Today"
1000 Radio For Peace Intl: "World of Radio"
1230 BBC (am/eur): "Waveguide"
1315 FEBC (Philippines): "DX Dial"
1330 WRMI (Florida): "Wavescan"
1720 Polish Radio: "Polish Radio DX Club"
1917 Radio Budapest Intl: "Radio Budapest DX Show"
1920 Argentina, RAE: "DXers Special"
1930 HCJB (eu): "Ham Radio Today"
2345 BBC (as): "Waveguide"

Thursdays

0117 Radio Budapest Intl: "Radio Budapest DX Show"

0130 HCJB (am): "Ham Radio Today"
0239 Argentina, RAE: "DXers Special"
0245 WRMI (Florida): "Wavescan"
0430 HCJB (am): "Ham Radio Today"
0754 Radio Netherlands Intl: "Media Network"
0830 Radio New Zealand Intl: "Mailbox (biweekly)"
0953 Radio Netherlands Intl: "Media Network"
1153 Radio Netherlands Intl: "Media Network"
1220 Polish Radio: "Polish Radio DX Club"
1352 Radio Netherlands Intl: "Media Network"
1753 Radio Netherlands Intl: "Media Network"
1954 Radio Netherlands Intl: "Media Network"
2030 WWCR #1 (Tennessee): "World of Radio"

Fridays

0053 Radio Netherlands Intl: "Media Network"
0053 Radio Netherlands Intl: "Media Network"
0245 WRMI (Florida): "Wavescan"
0253 Radio Netherlands Intl: "Media Network"
0453 Radio Netherlands Intl: "Media Network"
1045 KTWI (Guam): "Pacific DX Report"
1930 Radio New Zealand Intl: "Mailbox (biweekly)"
1946 Radio Bulgaria: "Radio Bulgaria Calling"
2000 WWCR #1 (Tennessee): "Ask WWCR"
2000 Radio For Peace Intl: "World of Radio"
2210 Australia, Radio: "Feedback"
2346 Radio Bulgaria: "Radio Bulgaria Calling"

Saturdays

0010 Australia, Radio: "Feedback"
0230 KWHR (Hawaii): "DXing with Cumbre"
0245 WRMI (Florida): "Wavescan"
0400 Radio For Peace Intl: "World of Radio"
0500 KWHR (Hawaii): "DXing with Cumbre"
0500 WHRI (Angel 1/2): "DXing with Cumbre"
0605 WWCR #1 (Tennessee): "World of Radio"
0809 HCJB (eu): "DX Partyline"
0909 HCJB (pac): "DX Partyline"
0915 WWCR #3 (Tennessee): "Ask WWCR"
0940 FEBC (Philippines): "DX Dial"

(Continued on Page 62)

FREQUENCIES

0000-0100	Anguilla, Caribbean Beacon	6090am				7150na	7180na	7240na	9150na
0000-0100	Australia, Radio	13605pa	15415as	15510as	17750as	9550na	9560na	9905na	12040na
0000-0100 vl	Australia, VL8K Katherine	5025do				5965as	5970am	5975am	6175am
0000-0100 vl	Australia, VL8T Tent Crk	4910do				6195as	9410as	9590am	11750sa
0000-0015	Cambodia, Natl Voice of	11940as				11955as	15310as		
0000-0100	Canada, CBC N Quebec Svc	9625do				3915as			
0000-0100	Canada, CFCX Montreal	6005do				7110as	9580as	11945as	15280as
0000-0100	Canada, CFRX Toronto	6070do				5810am			
0000-0100	Canada, CFVP Calgary	6030do				15590am			
0000-0100	Canada, CHNX Halifax	6130do				17510as			
0000-0100	Canada, CKZN St John's	6160do				7535am	9430sa	15665as	
0000-0100	Canada, CKZU Vancouver	6160do				7215as	9770as	11760as	15185as
0000-0100	China, China Radio Intl	9710na	11695na			15290as	17735as	17820as	
0000-0100	Costa Rica, RF Peace Intl	7385am	7585am	15050am		5995am	6130am	7405am	9455am
0000-0010	Croatia, Croatian Radio	5895na	7370eu			9775am	11695am	13740am	
0000-0027	Czech Rep., Radio Prague	5930na	7345na			5825eu	6890na		
0000-0100	Ecuador, HCJB	9745am	21455am			5085am			
0000-0030	Egypt, Radio Cairo	9900na				11950am			
0000-0015 vl	Ghana, Ghana Broadc Corp	3366do	4915do			0000-0100	USA, WJCR Upton KY		
0000-0045	India, All India Radio	7150as	9950as	11620as		0000-0100	USA, WRMI/R Miami Intl		
0000-0100	Japan, R Japan/NHK World	6155eu	6180eu			0000-0100	USA, WRNO New Orleans LA		
0000-0100	Lebanon, Voice of Hope	9960va				0000-0100	USA, WWCR Nashville TN	7435am	9475am
0000-0100	Liberia, LCN/R Liberia Int	5100do				0000-0100	USA, WYFR Okeechobee FL	9505ca	
0000-0100	Malaysia, Radio	7295do				0030-0100	Australia, Radio	11640as	12080pa
0000-0100	Malaysia, RTM Kuching	7160do						17795pa	17860pa
0000-0100	Netherlands, Radio	6020na	6165na	9845na		0030-0055	Austria, R Austria Intl	9655na	
0000-0100	New Zealand, R NZ Intl	15115pa				0030-0100	Iran, VOIRI	6050eu	9022eu
0000-0050	North Korea, R Pyongyang	11335na	13760na	15130na		0030-0100	Lithuania, Radio Vilnius	9855na	9685eu
0000-0100 vl	Papua New Guinea, NBC	9675do				0030-0100	Netherlands, Radio	5905as	7305as
0000-0100	Russia, Voice of Russia WS	7105na	7125na	7250na		0030-0100	Sri Lanka, Sri Lanka BC	9730as	9855as
0000-0030 mtwhtfa	Serbia, Radio Yugoslavia	9580na	11870na			0030-0100	Thailand, Radio	9655va	11905va
0000-0100	Spain, R Exterior Espana	6055am				0035-0040	India, All India Radio	5010do	15370as
0000-0030	Thailand, Radio	9655af	9690af	11905af		0050-0100	Italy, RAI Intl	7110do	11870do
0000-0100	Ukraine, R Ukraine Intl	5905na	6010na	6020na	6090na			9675na	11800na

SELECTED PROGRAMS

Sundays

0000	Ecuador, HCJB Quito (am): Adventures in Odyssey.
0009	Egypt, Radio Cairo: Egyptian Songs.
0011	New Zealand, Radio NZ Intl: Focus on Politics.
0017	China, China Radio Intl: Chinese Folktales.
0023	China, China Radio Intl: The Cooking Show.
0025	Netherlands, Radio (am): Insight.
0027	China, China Radio Intl: China Scrapbook.
0027	Spain, R Exterior de Espana: Distance Unknown.
0030	Australia, Radio: Correspondents' Report.
0030	Ecuador, HCJB Quito (am): Musical Mailbag.
0030	New Zealand, Radio NZ Intl: Insight '97.
0032	Russia, Voice of: Audio Book Club.
0035	China, China Radio Intl: Music from China.
0036	Lithuania, Radio Vilnius: Local Scene.
0036	Spain, R Exterior de Espana: Spanish Poparama.
0038	Netherlands, Radio (am): Newline.
0044	Thailand, Radio: Business News.
0050	Italy, RAI: News.

Mondays

0000	USA, WGTG, McCaysville GA: Full Disclosure Radio Show.
0000	Yugoslavia, Radio: News.
0009	Yugoslavia, Radio: Domestic Chronicle.
0011	Russia, Voice of: Moscow Mailbag.
0011	Spain, R Exterior de Espana: Visitors Book.
0020	China, China Radio Intl: China Snapshots.
0022	Spain, R Exterior de Espana: Spanish Echoes.
0025	China, China Radio Intl: In the Third World.
0035	Netherlands, Radio (am): Sincerely Yours.
0038	Spain, R Exterior de Espana: Radio Club.
0045	China, China Radio Intl: Listeners' Letterbox.
0049	Lithuania, Radio Vilnius: Folklore.

Tuesdays

0000	Croatia, Croatian Radio: News.
0000	Spain, R Exterior de Espana: The News from Spain.
0000	USA, WGTG, McCaysville GA: The Baker Report.
0000	USA, WWCR #1 Nashville TN: Newswatch Magazine.
0000	USA, WWCR #3 Nashville TN: The Intelligence Report (live).
0030	USA, VOA Washington DC (ca): Studio 38.
0032	Russia, Voice of: This is Russia.
0034	China, China Radio Intl: China's Open Windows.
0038	Netherlands, Radio (am): Newline.

0039	China, China Radio Intl: Changzhou Reports.
0041	Spain, R Exterior de Espana: Entertainment in Spain.
0045	China, China Radio Intl: Idioms and Their Stories.
0055	New Zealand, Radio NZ Intl: International Business News.

Wednesdays

0000	New Zealand, Radio NZ Intl: RNZ News.
0010	China, China Radio Intl: News about China.
0010	USA, VOA Washington DC (ca): Report to the Caribbean.
0015	Egypt, Radio Cairo: News.
0032	Russia, Voice of: Moscow Yesterday and Today.
0038	China, China Radio Intl: Orient Arena.
0039	Spain, R Exterior de Espana: Kaleidoscope.
0040	Netherlands, Radio (am): Newline.
0045	China, China Radio Intl: Listeners' Letterbox.
0050	Italy, RAI: News.

Thursdays

0000	New Zealand, Radio NZ Intl: RNZ News.
0000	USA, VOA Washington DC (am): VOA News.
0003	North Korea, R Pyongyang: News.
0008	New Zealand, Radio NZ Intl: Midday Report.
0010	USA, VOA Washington DC (ca): Report to the Caribbean.
0020	China, China Radio Intl: Current Affairs.
0031	New Zealand, Radio NZ Intl: RNZ News.
0033	China, China Radio Intl: Press Clippings.
0038	China, China Radio Intl: Profile.
0039	Spain, R Exterior de Espana: Window on Spain.

Fridays

0000	New Zealand, Radio NZ Intl: RNZ News.
0000	Spain, R Exterior de Espana: The News from Spain.
0032	Russia, Voice of: Moscow Yesterday and Today.
0036	Spain, R Exterior de Espana: Radio Club.
0038	China, China Radio Intl: Focus.
0038	Netherlands, Radio (am): Newline.
0044	China, China Radio Intl: Cultural Spectrum.
0053	Netherlands, Radio (am): Media Network.
0055	New Zealand, Radio NZ Intl: International Business News.

Saturdays

0000	Yugoslavia, Radio: News.
0011	New Zealand, Radio NZ Intl: National Radio.
0018	Yugoslavia, Radio: Heritage.

0030	Australia, Radio: Indian Pacific.
0030	Lithuania, Radio Vilnius: News.
0031	New Zealand, Radio NZ Intl: The Back Country.
0031	Spain, R Exterior de Espana: Spanish Music.
0034	China, China Radio Intl: Life in China.
0040	USA, VOA Washington DC (am): Environment Report (Special English).
0045	USA, VOA Washington DC (am): American Mosaic (Special English).
0046	China, China Radio Intl: Global Review.
0050	Lithuania, Radio Vilnius: Lithuanian Music.

HAUSER'S HIGHLIGHTS

CANADA: RCI - QUIRKS & QUARKS

Monday night on CBC, and RCI.

UTC Tue 0205 on 9755 and other freqs

Repeated the following weekend:

Sat 1609 on 9625, 2307 on 5960, 9755, 13670; Sun 1205 on 9640, 11855, 13650.

Past season repeats:

Tue 1305 on 9640, 11855, 13650 kHz

Some August topics:

4/9: Martian meteorite, humans in space, Carl Sagan

11/16: low dose radiation, Titanic, natural radio, malaria

18/23: M.S. and viruses, Capgras syndrome, elephant virus, can the mind help heal the body

25/30: question show (gh, CBC website)



FREQUENCIES

0100-0200	Anguilla, Caribbean Beacon	6090am				0100-0200	Philippines, FEBC/R Intl	15450as			
0100-0200	Australia, Radio	9660pa	11640as	12080pa	13605pa	0100-0200	Russia, Voice of Russia WS	7105na	12010na	12050na	13665na
		13755pa	15365pa	15415as	15510as			15180na	15595na		
		17715as	17750pa	17795pa	17860pa						
		17880pa				0100-0130	Slovakia, R Slovakia Intl	5930na	7300na	9440sa	
0100-0200 vl	Australia, VL8K Katherine	5025do				0100-0200	Spain, R Exterior Espana	6055am			
0100-0200 vl	Australia, VL8T Tent Crk	4910do				0100-0200	Sri Lanka, Sri Lanka BC	9730as			
0100-0200	Canada, CBC N Quebec Svc	9625do				0100-0130	Switzerland, Swiss R Intl	6135na	9885na	9905ca	
0100-0200	Canada, CFCX Montreal	6005do				0100-0200	United Kingdom, BBC WS	5965as	5970sa	5975am	6085am
0100-0200	Canada, CFRX Toronto	6070do						6145am	6175am	6195as	9410as
0100-0200	Canada, CFVP Calgary	6030do						9590am	9605as	11750am	11955as
0100-0200	Canada, CHNX Halifax	6130do						15280as	15310as	15360as	
0100-0200	Canada, CKZN St John's	6160do				0100-0200	USA, KAIJ Dallas TX	5810am			
0100-0200	Canada, CKZU Vancouver	6160do				0100-0200	USA, KJES Mesquite NM	7555am			
0100-0200	Canada, R Canada Intl	9535am	9755am	11715am	13670am	0100-0200	USA, KTNB Salt Lk City UT	7510am			
0100-0200	Costa Rica, RF Peace Intl	7385am	7585am	15050am		0100-0200	USA, KWHR Naalehu HI	17510au			
0100-0110	Croatia, Croatian Radio	5895na				0100-0200	USA, Monitor Radio Intl	7535na	9430am		
0100-0200	Cuba, Radio Havana	6000na	9820na	9830na		0100-0200	USA, Voice of America	7115as	7205as	9635as	11705as
0100-0127	Czech Rep, Radio Prague	6200na	7345na					11725as	15170as	15250as	17740as
0100-0200	Ecuador, HCJB	9745am	21455am					17820as			
0100-0150	Germany, Deutsche Welle	6040na	6085na	6145na	9640na	0100-0200 twifa	USA, Voice of America	5995am	6130am	7405am	9445am
		11810na						9775am	13740am		
		3366do	4915do			0100-0200	USA, WEWN Birmingham AL	5825eu	6890na		
0100-0115	Ghana, Ghana Broadc Corp	6075na	6190na	9580na		0100-0200	USA, WGTG McCaysville GA	5085am			
0100-0130	Hungary, Radio Budapest	9525na				0100-0200	USA, WHRI Noblesville IN	5745am			
0100-0200	Indonesia, Voice of	6050eu	9022eu	9685eu		0100-0200	USA, WINB Red Lion PA	11950am			
0100-0125	Iran, VOIRI	9875am				0100-0200	USA, WJCR Upton KY	7490na			
0100-0200 th	Ireland, W Coast R Ireland	6010na	9675na	11800na		0100-0200	USA, WRMI/R Miami Intl	9955am			
0100-0110	Italy, RAI Intl	5960na	11790as	11860as	11890na	0100-0200	USA, WRNO New Orleans LA	7355am			
0100-0200	Japan, R Japan/NHK World	13630am	15500as	15590as	17810as	0100-0200 mtwhf	USA, WVHA Greenbush ME	5850eu			
		21610as				0100-0200	USA, WWCR Nashville TN	5070am	5935am	7435am	13845am
0100-0200	Lebanon, Voice of Hope	9960va				0100-0200	USA, WYFR Okeechobee FL	6065na	9505na	11550as	
0100-0200	Liberia LCN/R Liberia Int	5100do				0100-0130	Uzbekistan, R Tashkent	7190eu	9375eu	9530eu	9715eu
0100-0200 smtwh	Malaysia, Radio	7295do				0100-0126	Vietnam, Voice of	7240na			
0100-0200 m	Malta, VO Mediterranean	13605am				0130-0150	Greece, Voice of	6260na	7450na	9420na	9935na
0100-0125	Netherlands, Radio	6020na	6165na	9845na		0130-0200	Netherlands, Radio	5905as	9855as	11655as	
0100-0200	Netherlands, Radio	5905as	7305as	9855as		0130-0200	Sweden, Radio	9435as			
0100-0200	New Zealand, R NZ Intl	15115pa				0130-0200 s	Sweden, Radio	7290am			
0100-0200 vl	Papua New Guinea, NBC	9675do				0140-0159	Vatican State, Vatican R	5980as	7335as		
						0145-0200	Albania, R Tirana Intl	6115na	7160na		

SELECTED PROGRAMS

Sundays

0100	Canada, RCI Montreal: RCI News.
0100	Ecuador, HCJB Quito (am): Latin and International News.
0100	Switzerland, Swiss Radio Intl: News.
0105	Switzerland, Swiss Radio Intl: Newsnet.
0106	Germany, Deutsche Welle: Sports Report.
0109	Ecuador, HCJB Quito (am): HCJB DX Partlyline.
0109	Germany, Deutsche Welle: Inside Europe.
0115	Switzerland, Swiss Radio Intl: The Name Game (1).
0130	Greece, Voice of: News.
0136	Cuba, Radio Havana Cuba: The World of Stamps.
0138	Germany, Deutsche Welle: Mailbag.
0145	Albania, Radio Tirana: News.

Mondays

0100	Cuba, Radio Havana Cuba: Sunday Edition.
0100	Ecuador, HCJB Quito (am): Latin and International News.
0106	USA, WHRI Noblesville IN (Angel 2): Radio Free America (live).
0110	Ecuador, HCJB Quito (am): Saludos Amigos.
0130	Cuba, Radio Havana Cuba: Musical Corner.
0151	Vatican State, Vatican Radio: The Background.

Tuesdays

0100	Canada, RCI Montreal: RCI News.
0100	Cuba, Radio Havana Cuba: International News.
0100	Ecuador, HCJB Quito (am): News.
0100	USA, WGTG, McCaysville GA: Blueprint for Survival.
0110	Ecuador, HCJB Quito (am): Studio 9.
0111	Canada, RCI Montreal: Spectrum.
0111	Russia, Voice of: Commonwealth Update.
0130	New Zealand, Radio NZ Intl: Cadanza.
0132	Russia, Voice of: Folk Box.
0138	Netherlands, Radio: Newslane.
0148	Vietnam, Voice of Vietnam: Vietnam--Land and People.

Wednesdays

0100	Canada, RCI Montreal: RCI News.
0100	Costa Rica, R for Peace Intl: FIRE (Feminist Intl Radio Endeavour).
0100	Czech Rep, Radio Prague: News.
0100	Ecuador, HCJB Quito (am): News.

0100	USA, VOA Washington DC (am): VOA News.
0105	Switzerland, Swiss Radio Intl: Newsnet.
0106	Germany, Deutsche Welle: NewsLink.
0110	Czech Rep, Radio Prague: Talking Point.
0130	Ecuador, HCJB Quito (am): El Mundo Futuro.
0133	Germany, Deutsche Welle: Insight.
0135	Cuba, Radio Havana Cuba: DXers Unlimited.
0150	Cuba, Radio Havana Cuba: Cuba Today.

Thursdays

0100	Canada, RCI Montreal: RCI News.
0100	Cuba, Radio Havana Cuba: International News.
0130	Ecuador, HCJB Quito (am): News.
0130	New Zealand, Radio NZ Intl: RNZ News.
0100	Switzerland, Swiss Radio Intl: News.
0100	Vietnam, Voice of Vietnam: News.
0105	Switzerland, Swiss Radio Intl: Newsnet.
0106	Germany, Deutsche Welle: NewsLink.
0130	Ecuador, HCJB Quito (am): Ham Radio Today.
0145	Vatican State, Vatican Radio: Mailbox.

Fridays

0100	Canada, RCI Montreal: RCI News.
0100	New Zealand, Radio NZ Intl: RNZ News.
0106	Germany, Deutsche Welle: NewsLink.
0108	New Zealand, Radio NZ Intl: Correspondence School.
0110	Cuba, Radio Havana Cuba: National News.
0110	Ecuador, HCJB Quito (am): Studio 9.
0111	Canada, RCI Montreal: Spectrum.
0130	Ecuador, HCJB Quito (am): Woman to Woman.
0140	Vatican State, Vatican Radio: United Nations Radio.
0145	Albania, Radio Tirana: News.
0155	Canada, RCI Montreal: News.

Saturdays

0100	Japan, Radio: News.
0100	New Zealand, Radio NZ Intl: RNZ News.
0100	USA, WYFR Okeechobee FL: Patterns in Music.
0100	Vietnam, Voice of Vietnam: News.
0105	Switzerland, Swiss Radio Intl: Newsnet.
0107	New Zealand, Radio NZ Intl: National Radio.
0110	Ecuador, HCJB Quito (am): Studio 9.

0110	Japan, Radio: Asia Weekly.
0117	Vietnam, Voice of Vietnam: Talk of the Week.
0130	Ecuador, HCJB Quito (am): Musica del Ecuador.
0132	Russia, Voice of: The Jazz Show.
0136	Cuba, Radio Havana Cuba: Weekly Review.
0140	Vietnam, Voice of Vietnam: Important Events in North Vietnam History.
0147	Vietnam, Voice of Vietnam: Talk of the Week.

HAUSER'S HIGHLIGHTS
TAJIKISTAN: R. DUSHANBE

monitored on
0100-0500 UTC 11620 kHz
1400-1800 UTC 7245 kHz
Dari, Persian, Arabic
0345, 1645 UTC 7245 kHz
English
Home Service-I
0030-0430 UTC 4635, 5800, 9905
1430-1830 UTC 4635, 5800, 7510
(Panview, Bulgaria via BC-DX)
V. of Free Tajikistan
announced schedule change to:
0230 UTC 5965, 7100 kHz
0530 UTC 7100-7300 kHz
(VOFT via BBCM)

FREQUENCIES

0200-0300	Anguilla, Caribbean Beacon	6090am				0200-0300	Taiwan, VO Free China	5950na	7130as	9680na	11740ca
0200-0300 1-th/vl	Argentina, RAE	11710am						11825as	15345as		
0200-0300	Australia, Radio	13605pa	13755pa	15240pa	15365pa	0200-0300	United Kingdom, BBC WS	5970sa	5975am	6135af	6175am
		15415as	15510as	17715as	17750pa			6195eu	9410va	9605as	11955as
		17795pa						15280as	15310as	15360as	
0200-0300 vl	Australia, VL8K Katherine	5025do				0200-0230	United Kingdom, BBC WS	9590am	9915am		
0200-0300 vl	Australia, VL8T Tent Crk	4910do				0200-0300	USA, KAIJ Dallas TX	5810am			
0200-0210	Bangladesh, Bangla Betar	4880do				0200-0230	USA, KJES Mesquite NM	7555am			
0200-0300	Canada, CBC N Quebec Svc.	9625do				0200-0300	USA, KTNB Salt Lk City UT	7510am			
0200-0300	Canada, CFCX Montreal	6005do				0200-0300	USA, KVOH Los Angeles CA	9975am			
0200-0300	Canada, CFRX Toronto	6070do				0200-0300	USA, KWHR Naalehu HI	17510au			
0200-0300	Canada, CFVP Calgary	6030do				0200-0300	USA, Monitor Radio Intl	5850na	7535am		
0200-0300	Canada, CHNX Halifax	6130do				0200-0300	USA, Voice of America	7115as	7205as	9635as	11705as
0200-0300	Canada, CKZN St John's	6160do						11725as	15170as	15250as	17740as
0200-0300	Canada, CKZU Vancouver	6160do						17820as			
0200-0300	Canada, R Canada Intl	6120am	9535am	9755am	11715am	0200-0300	USA, WEWN Birmingham AL	5825eu	6890na		
		13670am				0200-0300	USA, WGTG McCaysville GA	5085am			
0200-0300	Costa Rica, RF Peace Intl	7385am	7585am	15050am		0200-0300	USA, WHRI Noblesville IN	5745am	7315am		
0200-0210	Croatia, Croatian Radio	5895na				0200-0300	USA, WINB Red Lion PA	11950am			
0200-0300	Cuba, Radio Havana	6000na	9820na	9830na		0200-0300	USA, WJCR Upton KY	7490na			
0200-0300	Ecuador, HCJB	9745am	21455am			0200-0300 mtwhf	USA, WRMI/R Miami Intl	9955am			
0200-0300	Egypt, Radio Cairo	9475na				0200-0300	USA, WRNO New Orleans LA	7355am			
0200-0250	Germany, Deutsche Welle	7285as	9615as	9690as	11945as	0200-0300	USA, WWCR Nashville TN	3215am	5070am	5935am	7435am
		11965as	12045as			0200-0300	USA, WYFR Okeechobee FL	6065na	9505na		
0200-0300 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do		0230-0300	Albania, R Tirana Intl	6140na	7160na		
0200-0300	Lebanon, Voice of Hope	9960va				0230-0259	Austria, R Austria Intl	9655na	9870sa	13730sa	
0200-0300 smtwh	Malaysia, Radio	7295do				0230-0300	Hungary, Radio Budapest	6190na	9840na	11910na	
0200-0300 s	Malta, VO Mediterranean	15550au	17570as			0230-0300	Netherlands, Radio	9855as	11655as		
0200-0230	Netherlands, Radio	5905as	7305as	9855as	9855as	0230-0245	Pakistan, Radio	7255as	15120as	15485as	17705as
0200-0300	New Zealand, R NZ Intl	15115pa				0230-0300 vl/m-a	Philippines, R Pilipinas	11885me	15120me	15270me	
0200-0230 m	Norway, Radio Norway Intl	7465na	9560na			0230-0300	Sweden, Radio	7135na			
0200-0300 vl	Papua New Guinea, NBC	9675do				0230-0300	United Kingdom, BBC WS	7325am	9895am		
0200-0300	Philippines, FEBC/R Intl	15450as				0230-0256	Vietnam, Voice of	7250na			
0200-0256	Romania, R Romania Intl	5990na	6155na	9510na	9570na	0230-0300 vl	Zambia, R Zambia/ZNBC 2	6165do			
		11940na	12990na			0245-0300	India, All India Radio	6045do	7110do	11830do	15135do
0200-0300	Russia, Voice of Russia WS	7105na	12010na	12050na	13645na	0245-0255 vl	Mozambique, R Mozambique	4855do	7242do		
		13665na	15180na	15595na		0250-0300 sf	Greece, Voice of	6260na	7450na	9420na	9935na
0200-0300	South Korea, R Korea Intl	7275as	11725am	11810am	15575am	0250-0300	Vatican State, Vatican R	7305am	9605am		
0200-0300	Sri Lanka, Sri Lanka BC	9730as				0255-0300 vl	Zambia, R Zambia/ZNBC 1	4910do			

SELECTED PROGRAMS

Sundays

- 0200 Costa Rica, R for Peace Intl: World of Radio.
 0200 USA, WWCR #3 Nashville TN: Spectrum (WWCR) (live).
 0215 Taiwan, Voice of Free China: People.
 0230 Costa Rica, R for Peace Intl: RFPI's Mailbag.
 0231 Taiwan, Voice of Free China: Mailbag Time.
 0234 Cuba, Radio Havana Cuba: DXers Unlimited.
 0250 Vatican State, Vatican Radio: With Heart and Mind.
 0258 Vatican State, Vatican Radio: On-the-Air.

Mondays

- 0200 Germany, Deutsche Welle: News.
 0205 Canada, N Quebec Svc: Sunday Showcase.
 0215 Taiwan, Voice of Free China: Jade Bells and Bamboo Pipes.
 0230 Albania, Radio Tirana: News.
 0230 New Zealand, Radio NZ Intl: In Touch with New Zealand.
 0230 Vietnam, Voice of Vietnam: News.
 0245 UK, BBC London (AE/AF): The Lab. See M 1445.
 0246 Albania, Radio Tirana: Music at Your Request.

Tuesdays

- 0203 Taiwan, Voice of Free China: News.
 0211 Russia, Voice of: Newmarket.
 0215 Taiwan, Voice of Free China: Taiwan Today.
 0236 Costa Rica, R for Peace Intl: Hightower Radio.
 0240 Costa Rica, R for Peace Intl: Earth and Sky.

Wednesdays

- 0203 Taiwan, Voice of Free China: News.
 0215 Taiwan, Voice of Free China: Music Box.
 0230 Albania, Radio Tirana: News.
 0230 Ecuador, HCJB Quito (am): Unshackled.
 0230 New Zealand, Radio NZ Intl: In Touch with New Zealand.
 0237 Albania, Radio Tirana: PO Box Radio Tirana.
 0250 Vatican State, Vatican Radio: The Rome Report.
 0253 Albania, Radio Tirana: Press Review.

Thursdays

- 0200 Argentina, RAE: News.
 0211 Russia, Voice of: Moscow Mailbag.
 0222 Argentina, RAE: Music.
 0230 Albania, Radio Tirana: News.

- 0230 UK, BBC London (AS): India: A People Partitioned (6th, 13th). See S 1130.
 0239 Argentina, RAE: DXers Special.
 0245 Albania, Radio Tirana: Albanian Music.
 0250 Vatican State, Vatican Radio: The Pope and the People.
 0254 Vatican State, Vatican Radio: Pilgrim City.
 0255 Costa Rica, R for Peace Intl: Report from the Desert.
 0259 Vatican State, Vatican Radio: Would You Believe It?

Fridays

- 0200 New Zealand, Radio NZ Intl: RNZ News.
 0203 Taiwan, Voice of Free China: News.
 0215 Taiwan, Voice of Free China: Perspective.
 0230 Albania, Radio Tirana: News.
 0230 Ecuador, HCJB Quito (am): Inspirational Classics.
 0233 Taiwan, Voice of Free China: New Record Time.
 0240 Costa Rica, R for Peace Intl: Earth and Sky.
 0245 Albania, Radio Tirana: Current Affairs.

- 0250 Vatican State, Vatican Radio: Then and Now.

Saturdays

- 0200 Ecuador, HCJB Quito (am): On-Line.
 0200 New Zealand, Radio NZ Intl: RNZ News.
 0203 Taiwan, Voice of Free China: News.
 0206 Germany, Deutsche Welle: NewsLink.
 0211 Russia, Voice of: Moscow Mailbag.
 0215 Taiwan, Voice of Free China: Kaleidoscope.
 0217 Vietnam, Voice of Vietnam: Talk of the Week.
 0230 Ecuador, HCJB Quito (am): On Track.
 0232 Costa Rica, R for Peace Intl: Insight.
 0232 Russia, Voice of: Audio Book Club.
 0234 Germany, Deutsche Welle: Economic Notebook.
 0240 Costa Rica, R for Peace Intl: Earth and Sky.
 0245 Costa Rica, R for Peace Intl: Women.
 0247 Vietnam, Voice of Vietnam: Talk of the Week.
 0250 Vatican State, Vatican Radio: Facing the Challenge.

MT MONITORING TEAM

Next Reporting Deadline: August 20, 1997

Gayle Van Horn
Frequency Manager
swbcsked@grove.net

Jim Frimmel
Program Manager
DXComp@aol.com

Jacques d'Avignon
Propagation
Ontario, Canada
monitor@limestone.kosone.com

THANK YOU ...

ADDITIONAL CONTRIBUTORS TO THIS MONTH'S SHORTWAVE GUIDE:

John Babbis, Silver Spring, MD; Bob Fraser, Cohasset, MA; Clyde W. Harmon, Anniston, AL; George Jacobs & Assoc. Inc., Silver Spring, MD; Zelimir Klasan, Croatian Radio; Stig Hartvig Nielsen, World Music Radio; Paul M. Sorenson, Muskego, WI; BBCMS/World Media; *Cumbre DX*; *The Four Winds*; *DX Ontario*; *NASWA Journal*.

FREQUENCIES

0300-0400	Anguilla, Caribbean Beacon	6090am				0300-0400	Ukraine, R Ukraine Intl	7150na	9550na	12040na	
0300-0400	Australia, Radio	13605pa	13755pa	15240pa	15365pa	0300-0330	United Kingdom, BBC WS	5970sa	6135af	7325am	9895am
		15415as	15510as	17750pa	17795pa			15360as			
0300-0400 vl	Australia, VL8K Katherine	5025do				0300-0400	United Kingdom, BBC WS	3255af	5975am	6005af	6175na
0300-0400 vl	Australia, VL8T Tent Crk	4910do						6180eu	6190af	6195va	9410eu
0300-0400 vl	Canada, CBC N Quebec Svc	9625do						9600af	9605as	9895am	11760as
0300-0400	Canada, CFCX Montreal	6005do						12095af	15310as	17790as	21660as
0300-0400	Canada, CFRX Toronto	6070do				0300-0400	USA, KALJ Dallas TX	5810am			
0300-0400	Canada, CFVP Calgary	6030do				0300-0400	USA, KTNB Salt Lk City UT	7510am			
0300-0400	Canada, CHNX Halifax	6130do				0300-0400	USA, KVOH Los Angeles CA	9975am			
0300-0400	Canada, CKZN St John's	6160do				0300-0400	USA, KWHR Naalehu HI	17510au			
0300-0400	Canada, CKZU Vancouver	6160do				0300-0400	USA, Monitor Radio Intl	5850na	7535af		
0300-0400	China, China Radio Intl	9690na	9710na			0300-0400	USA, Voice of America	6080af	6115af	7105af	7280af
0300-0400 vl	Costa Rica, Faro del Carib	5055do						7290af	7340af	9575af	9885af
0300-0400	Costa Rica, RF Peace Intl	7385am	7585am	15050am		0300-0330 smtwh	USA, Voice of America	4960af			
0300-0310	Croatia, Croatian Radio	5895na				0300-0400	USA, WEWN Birmingham AL	5825eu	6890na		
0300-0400	Cuba, Radio Havana	6000na	9820na	9830na		0300-0400	USA, WGTG McCaysville GA	5085am			
0300-0327	Czech Rep, Radio Prague	5930as	7345as			0300-0400	USA, WHRI Noblesville IN	5745am	7315am		
0300-0400	Ecuador, HCJB	9745am	21455am			0300-0400	USA, WINB Red Lion PA	11950am			
0300-0330	Egypt, Radio Cairo	9475na				0300-0400	USA, WJCR Upton KY	7490na			
0300-0350	Germany, Deutsche Welle	6085na	6185na	9535na	9615na	0300-0400	USA, WRMI/R Miami Intl	9955am			
		9640na				0300-0400	USA, WRNO New Orleans LA	7395am			
0300-0400	Guatemala, Radio Cultural	3300do				0300-0400	USA, WWCR Nashville TN	3215am	5070am	5935am	7435am
0300-0400 m	Honduras, LV Evangelica	4820do				0300-0400	USA, WYFR Okeechobee FL	6065na	9505na		
0300-0400	Japan, R Japan/NHK World	17685va				0300-0310	Vatican State, Vatican R	7305na	9605am		
0300-0400 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do		0300-0400 vl	Zambia, R Zambia/ZNBC 1	4910do			
0300-0400	Lebanon, Voice of Hope	9960va				0300-0400 vl	Zambia, R Zambia/ZNBC 2	6165do			
0300-0400 vl	Lesotho, Radio Lesotho	4800do				0300-0400 vl	Zimbabwe, Zimbabwe BC	3396do			
0300-0400 vl	Malaysia, RTM Kuching	7160do				0310-0340	Vatican State, Vatican R	7360af	9660af		
0300-0400 s	Malta, VO Mediterranean	15550au	17570as			0330-0357	Czech Rep, Radio Prague	9480me	11600as		
0300-0330	Mexico, Radio Mexico Intl	9705na				0330-0355	Moldova, R Moldova Intl	7520na			
0300-0325	Netherlands, Radio	9855as	11655as			0330-0400 vl	Philippines, R Pilipinas	7730as	13770as	15330as	
0300-0400	New Zealand, R NZ Intl	15115pa				0330-0400 twhfa	Portugal, R Portugal Intl	6150am	9570am		
0300-0400 vl	Papua New Guinea, NBC	9675do				0330-0400	Slovakia, Adv World Radio	11610as			
0300-0330 vl	Philippines, R Pilipinas	11885as	15120as	15270as		0330-0400	Sweden, Radio	9430na			
0300-0400	Russia, Voice of Russia WS	12000na	12010na	12050na	13645na	0330-0400	Tanzania, Radio	5050af			
		13665na	15180na	15595na		0330-0400	United Kingdom, BBC WS	9610af	11730af	11955as	15280as
0300-0330	S Africa, Channel Africa	5955af				0333-0400 mtw	S Africa, Trans World R	7215af			
0300-0400	Sri Lanka, Sri Lanka BC	9730as				0335-0355 vl	India, All India Radio	7110do	11830do	15135do	
0300-0400	Taiwan, VO Free China	5950na	7130as	9680na	11745au	0340-0350	Greece, Voice of	6260na	7450na	9420na	9935na
		11825as	15345as			0345-0400	Burundi, Radio Nationale	6140do			
0300-0330	Thailand, Radio	9655na	11905na	15370na		0345-0400	Tajikistan, Radio Dushanbe	7245as	9905as		
0300-0400	Turkey, Voice of	7270as	7300eu	15190au		0345-0400 as	Uganda, Radio	4976do			
0300-0315 mtwhf	Uganda, Radio	4976do				0356-0400	Zambia, Christian Voice	3330af	6065af		

SELECTED PROGRAMS

Sundays

0300	Costa Rica, R for Peace Intl: CounterSpin.
0300	Germany, Deutsche Welle: News.
0303	Taiwan, Voice of Free China: News.
0309	Germany, Deutsche Welle: Inside Europe.
0315	Taiwan, Voice of Free China: Kaleidoscope.
0317	China, China Radio Intl: Chinese Folktales.
0323	China, China Radio Intl: The Cooking Show.
0327	China, China Radio Intl: China Scrapbook.
0332	Taiwan, Voice of Free China: Reflections.
0333	Vatican State, Vatican Radio: News of the Church.
0335	China, China Radio Intl: Music from China.
0338	Germany, Deutsche Welle: Mailbag.
0343	Vatican State, Vatican Radio: Panorama.

Mondays

0300	Costa Rica, R for Peace Intl: My Green Earth.
0300	New Zealand, Radio NZ Intl: RNZ News.
0303	Taiwan, Voice of Free China: News.
0306	New Zealand, Radio NZ Intl: In Touch with New Zealand.
0315	Taiwan, Voice of Free China: People.
0330	Costa Rica, R for Peace Intl: New Dimensions Radio.
0330	Ecuador, HCJB Quito (am): Joy International.
0330	USA, KWHR Naalehu HI: DXing with Cumbre.
0330	Vatican State, Vatican Radio: Panorama.
0335	China, China Radio Intl: Song of the Week.
0336	Taiwan, Voice of Free China: Mailbag Time.
0345	China, China Radio Intl: Listeners' Letterbox.

Tuesdays

0300	Ecuador, HCJB Quito (am): Chords of Love.
0304	Vatican State, Vatican Radio: Ask the Abbot.
0310	China, China Radio Intl: News about China.
0330	Costa Rica, R for Peace Intl: Insight & Outlook.
0333	Germany, Deutsche Welle: Man and Environment.
0345	China, China Radio Intl: Idioms and Their Stories.
0348	Portugal, Radio Portugal Intl: Visitors' Notebook.

Wednesdays

0300	Costa Rica, R for Peace Intl: World of Radio.
0300	Ecuador, HCJB Quito (am): Psychology for Living.
0306	Vatican State, Vatican Radio: What Can I Do?
0315	Taiwan, Voice of Free China: Taiwan Today.
0323	Turkey, Voice of: Popular Turkish Music.
0330	Costa Rica, R for Peace Intl: RFPI's Mailbag.
0330	Taiwan, Voice of Free China: Journey into Chinese Culture.
0332	Turkey, Voice of: Islands in the Sea.
0338	China, China Radio Intl: Orient Arena.
0345	China, China Radio Intl: Listeners' Letterbox.
0350	Portugal, Radio Portugal Intl: Musical Kaleidoscope.

Thursdays

0300	Croatia, Croatian Radio: News.
0300	Czech Rep, Radio Prague: News.
0304	Czech Rep, Radio Prague: Current Affairs.
0304	Vatican State, Vatican Radio: Postcards from Rome.
0307	Czech Rep, Radio Prague: Press Review.
0310	Czech Rep, Radio Prague: From the Archives.
0315	Taiwan, Voice of Free China: Music Box.
0317	Czech Rep, Radio Prague: The Arts.
0338	China, China Radio Intl: Profile.
0340	Czech Rep, Radio Prague: From the Archives.
0347	Czech Rep, Radio Prague: The Arts.
0350	Portugal, Radio Portugal Intl: The Challenge of the '90s.

Fridays

0300	Costa Rica, R for Peace Intl: Alternative Radio.
0300	Ecuador, HCJB Quito (am): Words for Women.
0305	Vatican State, Vatican Radio: Think of It this Way.
0315	Taiwan, Voice of Free China: Jade Bells and Bamboo Pipes.
0344	China, China Radio Intl: Cultural Spectrum.
0345	UK, BBC London (AS): Crossing the Border. See H 1515.
0346	Portugal, Radio Portugal Intl: Spotlight on Portugal.

Saturdays

0300	Costa Rica, R for Peace Intl: New Dimensions Radio.
0303	Taiwan, Voice of Free China: News.
0305	Vatican State, Vatican Radio: Ask the Abbot.
0306	Germany, Deutsche Welle: NewsLink.
0310	Australia, Radio: Ockham's Razor.
0310	China, China Radio Intl: News about China.
0310	USA, VOA Washington DC (af): VOA Saturday.
0311	Russia, Voice of: News and Views.
0332	Taiwan, Voice of Free China: New Record Time.
0334	China, China Radio Intl: Life in China.
0346	Portugal, Radio Portugal Intl: Collector's Corner (triweekly).
0346	Portugal, Radio Portugal Intl: Listeners Mailbag (triweekly).

PROPAGATION FORECASTING

JACQUES D'AVIGNON, VE3VIA
965 LINCOLN DRIVE
KINGSTON, ON K7M 4Z3
CANADA

DISTRIBUTOR ASAPS PROPAGATION SOFTWARE
E-MAIL: MONITOR@LIMESTONE.KOSONE.COM

FREQUENCIES

0400-0500	Anguilla, Caribbean Beacon	6090am				0400-0500	United Kingdom, BBC WS	3255af	3955eu	5975af	6005af
0400-0500	Australia, Radio	11880pa	13605as	15240pa	15365pa			6175am	6180eu	6190af	6195eu
		15415as	17750as	17795pa				7160af	9410na	9600af	11760va
0400-0500 vl	Australia, VL8K Katherine	5025do						11955as	12085af	12095va	15280as
0400-0500 vl	Australia, VL8T Tent Crk	4910do						15310as	15575va	17640af	17790as
0400-0500	Bulgaria, Radio	9485na	11720na					21660as			
0400-0500	Canada, CBC N Quebec Svc	9625do				0400-0430	United Kingdom, BBC WS	9605as	9610af	9895am	11730af
0400-0500	Canada, CFCX Montreal	6005do				0400-0500	USA, KALJ Dallas TX	5810am			
0400-0500	Canada, CFRX Toronto	6070do				0400-0500	USA, KTNB Salt Lk City UT	7510am			
0400-0500	Canada, CFVP Calgary	6030do				0400-0500	USA, KVOH Los Angeles CA	9975am			
0400-0500	Canada, CHNX Halifax	6130do				0400-0500	USA, KWHR Naalehu HI	17780as			
0400-0500	Canada, CKZN St John's	6160do				0400-0500	USA, Monitor Radio Intl	7535eu	9840af		
0400-0500	Canada, CKZU Vancouver	6160do				0400-0500	USA, Voice of America	6080af	7170af	7265af	7280af
0400-0430	Canada, R Canada Intl	9715me	11835me	15275me		0400-0500		7290af	9575af	9885af	11965me
0400-0500	China, China Radio Intl	9560na	9730am					15205va			
0400-0500	Costa Rica, RF Peace Intl	7385am	7585am	15050am		0400-0500	USA, WEWN Birmingham AL	5825eu	6890na		
0400-0410	Croatia, Croatian Radio	9495na				0400-0500	USA, WGTG McCaysville GA	5085am			
0400-0500	Cuba, Radio Havana	6000na	6180na	9820na	9830na	0400-0500	USA, WHRI Noblesville IN	5745am	7315am		
0400-0500 vl	Cyprus, BRT International	6150do				0400-0500	USA, WINB Red Lion PA	11950am			
0400-0500	Ecuador, HCJB	9745am	21455am			0400-0500	USA, WJCR Upton KY	7490na			
0400-0450	Germany, Deutsche Welle	5990af	6015af	7225af	9565af	0400-0500 smtwht	USA, WMLK Bethel PA	9465eu			
		11765af				0400-0500	USA, WRMI R Miami Intl	9955am			
0400-0500 twifa	Guatemala, Radio Cultural	3300do				0400-0500	USA, WRNO New Orleans LA	7395am			
0400-0500 m	Honduras, LV Evangelica	4820do				0400-0500	USA, WWCR Nashville TN	2390am	3215am	5070am	5935am
0400-0415	Israel, Kol Israel	7465na	9435na	17545af		0400-0500	USA, WYFR Okeechobee FL	6065na	9505na	9985eu	
0400-0500 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do		0400-0430	Vietnam, Voice of	12020na	15010na		
0400-0500	Lebanon, Voice of Hope	9960va				0400-0500	Zambia, Christian Voice	3330af	6065af		
0400-0500 s	Malta, VO Mediterranean	15550as	17570au			0400-0500 vl	Zambia, R Zambia/ZNBC 1	4910do			
0400-0430 m-a/vl	Mexico, Radio Mexico Intl	9705na				0400-0500 vl	Zambia, R Zambia/ZNBC 2	6165do			
0400-0458	New Zealand, R NZ Intl	15115pa				0400-0500 vl	Zimbabwe, Zimbabwe BC	3396do			
0400-0450	North Korea, R Pyongyang	15180as	15230as	17765as		0415-0500 vl	Malawi, MBC	5993do			
0400-0430 m	Norway, Radio Norway Intl	7485na				0425-0440 vl	Italy, RAI Intl	5975eu	7270eu		
0400-0500 vl	Papua New Guinea, NBC	9675do				0425-0500	Nigeria, FRCN/Radio	3326do	4770do	4990do	
0400-0456	Romania, R Romania Intl	5990na	6155na	9510na	9570na	0430-0500	Australia, Defense Forces R	13525as			
		11940na	12990na			0430-0459	Austria, R Austria Intl	6155eu	13730eu		
0400-0500	Russia, Voice of Russia WS	12000na	12010na	12050na	13645na	0430-0500 m-f/vl	Lesotho, Radio Lesotho	4800do			
		13665na	15180na	15445na	15595na	0430-0455	Moldova, R Moldova Intl	7520na			
0400-0430	S Africa, Channel Africa	5955af				0430-0500	Netherlands, Radio	6165na	9590na		
0400-0404 mtw	S Africa, Trans World R	7215af				0430-0500	Serbia, Radio Yugoslavia	9580na	11800na		
0400-0430	Sri Lanka, Sri Lanka BC	9730as				0430-0500	Swaziland, Trans World R	3200af	4775af	6100af	
0400-0430	Switzerland, Swiss R Intl	6135na	9885na			0430-0500	Switzerland, Swiss R Intl	9905ca			
0400-0430	Tanzania, Radio	5050af				0430-0500	United Kingdom, BBC WS	15420af			
0400-0500	Turkey, Voice of	7340na				0455-0500	Malaysia, Voice of	6175as	9750as	15295au	
0400-0415	Uganda, Radio	4976do				0459-0500	New Zealand, R NZ Intl	9795pa			

SELECTED PROGRAMS

Sundays

0400	Costa Rica, R for Peace Intl: The Far Right Radio Review.
0400	Ecuador, HCJB Quito (am): Latin and International News.
0400	Switzerland, Swiss Radio Intl: News.
0400	USA, VOA Washington DC (af): VOA News.
0405	Switzerland, Swiss Radio Intl: Newsnet.
0409	Ecuador, HCJB Quito (am): HCJB DX Partyline.
0410	USA, VOA Washington DC (af): VOA Sunday.
0415	Switzerland, Swiss Radio Intl: Capital Letters (2/4).
0438	Netherlands, Radio (am): Newslines.
0454	Netherlands, Radio (am): Weekend.

Mondays

0400	New Zealand, Radio NZ Intl: Pacific Regional News.
0405	New Zealand, Radio NZ Intl: Calling Cook Islands.
0405	Switzerland, Swiss Radio Intl: Newsnet.
0408	Germany, Deutsche Welle: Inside Europe.
0410	Ecuador, HCJB Quito (am): Saludos Amigos.
0430	New Zealand, Radio NZ Intl: RNZI Mailbox (biweekly).
0430	New Zealand, Radio NZ Intl: Travel Pacific (biweekly).
0430	Switzerland, Swiss Radio Intl: Rendez-vous with Switzerland.
0430	USA, VOA Washington DC (af): Daybreak Africa.
0437	Netherlands, Radio (am): Sincerely Yours.
0446	Switzerland, Swiss Radio Intl: Capital Letters (2/4).

Tuesdays

0400	Costa Rica, R for Peace Intl: Alternative Radio.
0400	New Zealand, Radio NZ Intl: Pacific Regional News.
0400	USA, VOA Washington DC (af): VOA News.
0405	New Zealand, Radio NZ Intl: Calling Tonga.
0405	Switzerland, Swiss Radio Intl: Newsnet.
0410	Ecuador, HCJB Quito (am): Studio 9.
0430	Ecuador, HCJB Quito (am): You Should Know.
0430	Switzerland, Swiss Radio Intl: Rendez-vous with Switzerland.
0430	USA, VOA Washington DC (af): Daybreak Africa.
0430	USA, VOA Washington DC (me): Studio 38.

0431	New Zealand, Radio NZ Intl: The World in Sport.
0438	Netherlands, Radio (am): Newslines.

Wednesdays

0400	Costa Rica, R for Peace Intl: UN World Chronicle.
0400	Ecuador, HCJB Quito (am): News.
0400	Guatemala, TGNA: Insight for Living.
0405	Switzerland, Swiss Radio Intl: Newsnet.
0410	Ecuador, HCJB Quito (am): Studio 9.
0410	USA, VOA Washington DC (af): VOA Business Report.
0430	Ecuador, HCJB Quito (am): El Mundo Futuro.
0430	Switzerland, Swiss Radio Intl: Rendez-vous with Switzerland.
0430	USA, VOA Washington DC (me): Studio 38.
0438	Netherlands, Radio (am): Newslines.
0453	Netherlands, Radio (am): Mirror Images.

Thursdays

0400	Switzerland, Swiss Radio Intl: News.
0405	Switzerland, Swiss Radio Intl: Newsnet.
0410	Ecuador, HCJB Quito (am): Studio 9.
0415	Bulgaria, Radio: Events and Developments.
0430	Bulgaria, Radio: Answering Your Letters.
0430	Ecuador, HCJB Quito (am): Ham Radio Today.
0430	Switzerland, Swiss Radio Intl: Rendez-vous with Switzerland.
0430	USA, VOA Washington DC (af): Daybreak Africa.
0430	USA, VOA Washington DC (me): Studio 38.
0438	Netherlands, Radio (am): Newslines.
0453	Netherlands, Radio (am): Documentary.

Fridays

0400	Costa Rica, R for Peace Intl: Micro-Power Radio in the U.S.
0400	Croatia, Croatian Radio: News.
0400	Ecuador, HCJB Quito (am): News.
0405	Switzerland, Swiss Radio Intl: Newsnet.
0410	Ecuador, HCJB Quito (am): Studio 9.
0410	USA, VOA Washington DC (af): VOA Business Report.

0430	Costa Rica, R for Peace Intl: WINGS.
0438	Netherlands, Radio (am): Newslines.
0453	Netherlands, Radio (am): Media Network.

Saturdays

0400	Costa Rica, R for Peace Intl: World of Radio.
0400	Ecuador, HCJB Quito (am): News.
0400	New Zealand, Radio NZ Intl: RNZ News.
0405	Switzerland, Swiss Radio Intl: Newsnet.
0406	Germany, Deutsche Welle: NewsLink.
0410	Ecuador, HCJB Quito (am): Studio 9.
0410	USA, VOA Washington DC (af): VOA Saturday.
0430	Costa Rica, R for Peace Intl: RFPI's Mailbag.
0430	Ecuador, HCJB Quito (am): Musica del Ecuador.
0438	Netherlands, Radio (am): Newslines.

International Callsign Directory

The most exhaustive list of tactical callsigns and their identifications ever assembled for shortwave and scanner listeners in a massive 250 page directory!

Now only \$9.95 plus \$6 UPS
Order today from
Grove Enterprises

FREQUENCIES

0500-0600	Anguilla, Caribbean Beacon	6090am				0500-0530	Switzerland, Swiss R Intl	6165eu	9535eu		
0500-0600	Australia, Radio	12080pa	13605as	15240pa	15365pa	0500-0515	Uganda, Radio	4976do			
		15415as	15420pa	15510as	15530as	0500-0600	United Kingdom, BBC WS	3255af	3955eu	5975am	6005af
		17795pa	17880as					6175am	6180eu	6190af	6195va
0500-0600 vl	Australia, VL8K Katherine	5025do						7120va	7160af	9410va	9600af
0500-0600 vl	Australia, VL8T Tent Crk	4910do						9610af	9740as	11760as	11940af
0500-0600	Australia, Defense Forces R	13525as						12095as	15310as	15360as	15420af
0500-0600 vl	Cameroon, Radio Cameroon	4850do						15575va	17640af	17760as	17885af
0500-0600	Canada, CFCX Montreal	6005do						21660as			
0500-0600	Canada, CFRX Toronto	6070do				0500-0530	United Kingdom, BBC WS	15280as	17790as		
0500-0600	Canada, CFVP Calgary	6030do				0500-0600	USA, KALJ Dallas TX	5810am			
0500-0600	Canada, CHNX Halifax	6130do				0500-0600	USA, KTNB Salt Lk City UT	7510am			
0500-0600	Canada, CKZU Vancouver	6160do				0500-0600	USA, KVOH Los Angeles CA	9975am			
0500-0530 mtwhf	Canada, R Canada Intl	6050eu	7295af	11835af	15430me	0500-0600	USA, KWHR Naalehu HI	17780as			
0500-0600	Costa Rica, Adv World R	5030ca	6150ca	9725ca		0500-0600	USA, Monitor Radio Intl	7535eu			
0500-0600 as	Costa Rica, Adv World R	7375am				0500-0600	USA, Voice of America	5970af	6035af	6080af	7170va
0500-0600	Costa Rica, RF Peace Intl	7385am	7585am					7195af	9630af	11965me	12080af
0500-0600	Cuba, Radio Havana	9820na	9830na					13740af	15205va		
0500-0600	Ecuador, HCJB	9745am	21455am			0500-0600	USA, WGTG McCaysville GA	5085am			
0500-0550	Germany, Deutsche Welle	5960na	6045na	6120na	6145na	0500-0600	USA, WHRI Noblesville IN	5745am		7315am	
		6185na	9615na	9650na		0500-0600	USA, WINB Red Lion PA	11950am			
0500-0600	Guyana, GBC/Voice of	3290do				0500-0600	USA, WJCR Upton KY	7490na			
0500-0600 vl	Italy, IRRS	3985va				0500-0600 smtwhf	USA, WMLK Bethel PA	9465eu			
0500-0530 vl	Italy, IRRS	7125va				0500-0600	USA, WRMI/R Miami Intl	9955am			
0500-0600	Japan, R Japan/NHK World	6110na	7230eu	11840as	11895eu	0500-0600	USA, WRNO New Orleans LA	7395am			
		11920na	13630na			0500-0600	USA, WWCR Nashville TN	2390am	3210am	5070am	5935am
0500-0530	Japan, R Japan/NHK World	13630na	15230na			0500-0600	USA, WYFR Okeechobee FL	5985na	9985af	11580eu	
0500-0600 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do		0500-0530	Vatican State, Vatican R	9660af	11625af	15570af	
0500-0600	Lebanon, Voice of Hope	9960va				0500-0520	Vatican State, Vatican R	4005eu	5882eu	7250eu	
0500-0505	Lesotho, Radio Lesotho	4800do				0500-0600	Zambia, Christian Voice	3330af	6065af		
0500-0600	Liberia, LCN/R Liberia Int	5100do				0500-0530 vl	Zambia, R Zambia/ZNBC 1	4910do			
0500-0510 mtwhf	Malawi, MBC	3380do				0500-0600 vl	Zambia, R Zambia/ZNBC 2	6165do			
0500-0525	Netherlands, Radio	6165na	9590na			0500-0530 vl	Zimbabwe, Zimbabwe BC	3396do			
0500-0600	New Zealand, R NZ Intl	9795pa				0505-0600	Swaziland, Trans World R	3200af	4775af	6070af	9500af
0500-0505	Nigeria, FRCN/Radio	3326do	4770do	4990do		0525-0600	Ghana, Ghana Broadc Corp	3366do	4915do		
0500-0600	Nigeria, Voice of	7255af				0530-0559	Austria, R Austria Intl	6015na			
0500-0600 vl	Papua New Guinea, NBC	9675do				0530-0600 vl	Kiribati, Radio	9810do			
0500-0600	Russia, Voice of Russia WS	12000na	12010na	12050na	13645na	0530-0556	Romania, R Romania Intl	11790af	11940af	15250af	15270af
		13665na	15445na	15595na				15340as	17720as	17790af	
0500-0530	S Africa, Channel Africa	9675af				0530-0600	Thailand, Radio	9655eu	11905eu	15115eu	
0500-0556	Spain, R Exterior Espana	6055am				0530-0600 vl	Zambia, R Zambia/ZNBC 1	7220do			
0500-0530	Swaziland, Trans World R	6100af				0530-0600 vl	Zimbabwe, Zimbabwe BC	5975do			

SELECTED PROGRAMS

Sundays

- 0500 Costa Rica, R for Peace Intl: RadioNation.
- 0500 Ecuador, HCJB Quito (am): Musical Mailbag.
- 0500 Vatican State, Vatican Radio: With Heart and Mind.
- 0506 Germany, Deutsche Welle: Sports Report.
- 0508 Vatican State, Vatican Radio: On-the-Air.
- 0509 Germany, Deutsche Welle: Inside Europe.
- 0510 USA, VOA Washington DC (af): VOA Sunday.
- 0527 Spain, R Exterior de Espana: Distance Unknown.
- 0536 Spain, R Exterior de Espana: Spanish Poparama.
- 0538 Germany, Deutsche Welle: Mailbag.

Mondays

- 0500 Japan, Radio: Dateline Japan.
- 0500 New Zealand, Radio NZ Intl: RNZ News.
- 0500 USA, WWCR #3 Nashville TN: Ask WWCR.
- 0500 Vatican State, Vatican Radio: To the Ends of the Earth.
- 0511 Russia, Voice of: Moscow Mailbag.
- 0515 Japan, Radio: Asian Top News.
- 0522 Spain, R Exterior de Espana: Spanish Echoes.
- 0532 Russia, Voice of: This is Russia.

Tuesdays

- 0500 Costa Rica, R for Peace Intl: UN Caribbean Echo.
- 0500 Germany, Deutsche Welle: News.
- 0500 Japan, Radio: Dateline Japan.
- 0500 New Zealand, Radio NZ Intl: RNZ News.
- 0500 Vatican State, Vatican Radio: A Room with a View of the Vatican.
- 0507 New Zealand, Radio NZ Intl: Checkpoint.
- 0510 USA, VOA Washington DC (af): VOA Today.
- 0515 Vatican State, Vatican Radio: Ask the Abbot.
- 0517 Costa Rica, R for Peace Intl: Earth and Sky.
- 0520 Costa Rica, R for Peace Intl: Hightower Radio.
- 0525 Costa Rica, R for Peace Intl: Earthwatch Radio.
- 0530 Costa Rica, R for Peace Intl: Micro-Power Radio in the U.S.

Wednesdays

- 0500 Costa Rica, R for Peace Intl: People's Radio.

Thursdays

- 0500 Germany, Deutsche Welle: News.
- 0500 Japan, Radio: Dateline Japan.
- 0500 New Zealand, Radio NZ Intl: RNZ News.
- 0500 USA, VOA Washington DC (af): VOA News.
- 0500 Vatican State, Vatican Radio: The Environment.
- 0500 Vatican State, Vatican Radio: The Rome Report.
- 0510 Costa Rica, R for Peace Intl: Insight.
- 0510 USA, VOA Washington DC (af): VOA Today.
- 0510 Vatican State, Vatican Radio: News from the African Church.
- 0516 Vatican State, Vatican Radio: What Can I Do?
- 0531 Australia, Radio: Blacktracker.

Fridays

- 0500 Germany, Deutsche Welle: News.
- 0500 Japan, Radio: Dateline Japan.
- 0500 New Zealand, Radio NZ Intl: RNZ News.
- 0500 South Africa, Channel Africa: News.
- 0500 USA, VOA Washington DC (af): VOA News.
- 0500 Vatican State, Vatican Radio: The Pope and the People.
- 0505 South Africa, Channel Africa: Dateline Africa.
- 0505 Vatican State, Vatican Radio: Pilgrim City.
- 0510 Costa Rica, AWR: Focus on God's Love.
- 0510 USA, VOA Washington DC (af): VOA Today.
- 0514 Vatican State, Vatican Radio: Postcards from Rome.
- 0515 Costa Rica, R for Peace Intl: UN Daily News.
- 0530 Costa Rica, R for Peace Intl: Vietnam Veterans Radio Network.

Saturdays

- 0500 Germany, Deutsche Welle: News.
- 0500 Japan, Radio: Dateline Japan.
- 0500 New Zealand, Radio NZ Intl: RNZ News.
- 0500 USA, VOA Washington DC (af): VOA News.
- 0500 Vatican State, Vatican Radio: Then and Now.
- 0506 Germany, Deutsche Welle: NewsLink.
- 0510 USA, VOA Washington DC (af): VOA Today.
- 0515 Japan, Radio: Asian Top News.
- 0525 Costa Rica, AWR: Voice of Prophecy.
- 0530 Costa Rica, R for Peace Intl: My Green Earth.

Sundays

- 0500 USA, KWHR Naalehu HI: DXing with Cumbre.
- 0500 Vatican State, Vatican Radio: By the Way....
- 0500 Vatican State, Vatican Radio: News.
- 0506 Vatican State, Vatican Radio: Roundtable Discussion.
- 0510 USA, VOA Washington DC (af): VOA Saturday.
- 0530 Costa Rica, R for Peace Intl: Second Opinion.
- 0530 Ecuador, HCJB Quito (am): On Track.
- 0530 UK, BBC London (AS): India: A People Partitioned (2nd.9th). See S 1130.
- 0530 USA, KWHR Naalehu HI: Christian Country Music.



Your Name in Lights!

... or at least in ink within the
Monitoring Times Shortwave Guide.
Please send us your "best catches" on
the worldwide shortwave bands —
QSLs, that is — and we will try to use
them in future issues of *MT*. Your
QSLs will be returned.



FREQUENCIES

0600-0700	Anguilla Caribbean Beacon	6090am				0600-0630	Slovakia, Adv World Radio	11640af			
0600-0700	Australia, Radio	13605as	15415as	15530as	17715as	0600-0630 vl	Solomon Islands, SIBC	5020do	9545do		
		17750as				0600-0630	Switzerland, Swiss R Intl	9885af	11860af	13635af	
0600-0630	Australia, Radio	11880pa	17795pa			0600-0700	United Kingdom, BBC WS	5975am	6005af	6175am	6180eu
0600-0700 vl	Australia, VL8K Katherine	5025do						6190af	6195eu	7145as	7160af
0600-0700 vl	Australia, VL8T Tent Crk	4910do						7325va	9410va	9600af	9740as
0600-0633	Australia, Defense Forces R	13525as						11760as	11780eu	11940af	12095eu
0600-0700 vl	Canada, CBC N Quebec Svc	9625do						15310as	15360as	15420af	15565va
0600-0700	Canada, CFCX Montreal	6005do						15575va	17640af	17785as	17885af
0600-0700	Canada, CFRX Toronto	6070do						21660as			
0600-0700	Canada, CFVP Calgary	6030do				0600-0700	USA, KAIJ Dallas TX	5810am			
0600-0700	Canada, CHNX Halifax	6130do				0600-0700	USA, KTNB Salt Lk City UT	7510am			
0600-0700	Canada, CKZU Vancouver	6160do				0600-0700	USA, KVOH Los Angeles CA	9975am			
0600-0700	Costa Rica, RF Peace Intl	7385am	7585am			0600-0700	USA, KWHR Naalehu HI	9930as			
0600-0700	Cuba, Radio Havana	6000na	9820na	9830na		0600-0700	USA, Monitor Radio Intl	7535eu			
0600-0700	Ecuador, HCJB	9745am	21455am			0600-0630	USA, Voice of America	5970af	5995af	6035af	6080af
0600-0650	Germany, Deutsche Welle	11915af	13790af	15185af	17820as			7170va	7195af	9630af	11805af
		17860af	21680af					11950af	11965me	12080af	15205va
		4915do						5825eu	6890na	9370na	
0600-0615	Ghana, Ghana Broadc Corp	3366do				0600-0700	USA, WEWN Birmingham AL	5825eu			
0600-0700	Guyana, GBC/Voice of	3290do				0600-0700	USA, WHRI Noblesville IN	5745am			
0600-0700 vl	Italy, IRRS	3985va				0600-0700	USA, WJCR Upton KY	7490na			
0600-0700	Japan, R Japan/NHK World	5975eu	7230eu	9835as	11740as	0600-0700 smtwhf	USA, WMLK Bethel PA	9465eu			
		11840as	11910am	11920na	12030as	0600-0700	USA, WRNO New Orleans LA	7355am			
		15230na	15550va	17810as		0600-0700	USA, WYFR Nashville TN	2390am	3210am	5070am	5935am
0600-0700 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do		0600-0700	USA, WYFR Okeechobee FL	5985am	7355eu	9985eu	
0600-0700 vl	Kiribati, Radio	9810do				0600-0645 vl/m-f	Vatican State, Vatican R	5882va	7250va	9645va	11740va
0600-0700	Lebanon, Voice of Hope	9960va						15595va			
0600-0700	Liberia, LCN/R Liberia Int	5100do				0600-0630	Vietnam, Voice of	5925as	10060as		
0600-0700	Malaysia, Voice of	6175as	9750as	15295au		0600-0700	Yemen, Yemeni Rep Radio	9780do			
0600-0700	New Zealand, R NZ Intl	9795pa				0600-0700	Zambia, Christian Voice	3330af	60E5af		
0600-0630	Nigeria, FRCN/Radio	3326do	4770do	4990do		0600-0700 vl	Zambia, R Zambia/ZNBC 1	7220do			
0600-0700	Nigeria, Voice of	7255af				0600-0700 vl	Zimbabwe, Zimbabwe BC	5975do			
0600-0650	North Korea, R Pyongyang	15180as	15230as			0605-0700	Swaziland, Trans World R	4775af	6100af	9500af	9650af
0600-0630 s	Norway, Radio Norway Intl	7180eu	7295pa	9590af	13805af	0615-0630	Switzerland, Swiss R Intl	6165eu	9535eu		
0600-0700 vl	Papua New Guinea, NBC	9675do				0630-0700	Belgium, R Vlaanderen Int	6035eu	9925eu	9940au	
0600-0700	Russia, Voice of Russia WS	12000au	12010as	12040as	12050as	0630-0700	Georgia, Radio	11805eu			
		12070as	13645pa	13665pa	15470pa	0630-0658	Vatican State, Vatican R	11625af	13765af	15570af	
		15490pa	15560va	15580va	15595va	0631-0640	Romania, R Romania Intl	9550eu	9665eu	11810eu	15365eu
		17570au	17580au	17610au	17610pa	0645-0700 as	Monaco, Trans World Radio	9755eu			
		17795va				0645-0700	Romania, R Romania Intl	11740pa	11840pa	15250pa	15270pa
0600-0630	S Africa, Channel Africa	11900af						17720pa			
0600-0657	S Africa, Trans World R	11730af				0655-0700 mtwhf	Monaco, Trans World Radio	9755eu			
0600-0610	Sierra Leone, SLBS	3316do									

SELECTED PROGRAMS

Sundays

0600	Costa Rica, R for Peace Intl: Disability Radio Worldwide.
0600	USA, VOA Washington DC (af/me): VOA News.
0610	USA, VOA Washington DC (af/me): VOA Sunday.
0615	Switzerland, Swiss R Intl (eu): News.
0620	Switzerland, Swiss R Intl (eu): Newsnet.

Mondays

0600	Costa Rica, R for Peace Intl: The Far Right Radio Review.
0600	Ecuador, HCJB Quito (am): Mountain Meditations.
0600	New Zealand, Radio NZ Intl: RNZ News.
0607	New Zealand, Radio NZ Intl: Checkpoint.
0615	Japan, Radio: 44 Minutes.
0615	Nigeria, Voice of: Nigeria and Politics.
0620	Switzerland, Swiss R Intl (eu): Newsnet.
0630	Ecuador, HCJB Quito (am): Musica del Ecuador.

Tuesdays

0600	USA, VOA Washington DC (af): Daybreak Africa.
0600	USA, VOA Washington DC (me): VOA News.
0610	USA, VOA Washington DC (me): VOA Worldwide.
0620	Switzerland, Swiss R Intl (eu): Newsnet.
0630	Ecuador, HCJB Quito (am): Nightsounds.
0652	Vatican State, Vatican Radio: Panorama.

Wednesdays

0600	USA, VOA Washington DC (af): Daybreak Africa.
0610	USA, VOA Washington DC (me): VOA Worldwide.
0620	Switzerland, Swiss R Intl (eu): Newsnet.
0630	Ecuador, HCJB Quito (am): Nightsounds.

Thursdays

0600	Nigeria, Voice of: West African Scene.
0600	USA, VOA Washington DC (af): Daybreak Africa.
0610	USA, VOA Washington DC (me): VOA Worldwide.
0615	Switzerland, Swiss R Intl (eu): News.
0620	Switzerland, Swiss R Intl (eu): Newsnet.
0630	Ecuador, HCJB Quito (am): Nightsounds.

Fridays

0600	Costa Rica, R for Peace Intl: Second Opinion.
0600	USA, VOA Washington DC (af): Daybreak Africa.
0610	USA, VOA Washington DC (me): VOA Worldwide.
0620	Switzerland, Swiss R Intl (eu): Newsnet.
0630	Costa Rica, R for Peace Intl: University of the Air.
0630	Ecuador, HCJB Quito (am): Nightsounds.
0652	Vatican State, Vatican Radio: Panorama.

Saturdays

0600	Australia, Radio: World News.
0600	Costa Rica, R for Peace Intl: Steppin' Out of Babylon.
0600	USA, KAIJ Dallas TX: World University Network.

0600	USA, KTNB Salt Lk City UT: The Dream Center.
0610	Australia, Radio: Book Reading.
0620	Switzerland, Swiss R Intl (eu): Newsnet.
0630	Ecuador, HCJB Quito (am): Nightsounds.
0630	USA, KTNB Salt Lk City UT: In the Name of Satan.
0630	USA, KWHR Naalehu HI: The Word of God Broadcast.
0630	Vatican State, Vatican Radio: The Gospel.
0635	Vatican State, Vatican Radio: Reflection.
0641	Vatican State, Vatican Radio: Justice and Peace.
0645	USA, KWHR Naalehu HI: Truth for the World.
0650	Vatican State, Vatican Radio: News of the Church.
0654	Vatican State, Vatican Radio: Panorama.

HAUSER'S HIGHLIGHTS
KUWAIT: R. KUWAIT

June schedule in English
1800-2100 UTC

Islam - Religion of Truth and Justice
Kuwait the Home and the Land
Kuwait's Existence & Boundary
The Gulf of Love
Lest We Forget
Pioneers & Personalities in Kuwait

Mostly music at other times except news at 1830

Entire Thursday broadcast is still relay of FM Super Station on 99.7 MHz (gh)

11990 MHz
Fri-Tue 2000, Wed 1802
Fri & Sun 1802
Wed 1802
Sat 1802
Wed 1815, Fri-Tue 2030
Sun 2015



FREQUENCIES

0700-0800	Anguilla, Caribbean Beacon	6090am				0800-0900	Anguilla, Caribbean Beacon	6090am			
0700-0830	Australia, Radio	9580pa	9860pa	12080pa	13605as	0800-0900	Australia, Radio	5995pa	6020pa	6080pa	9580pa
		15240pa	15365pa	15415as	15530as			9710pa	9860pa	12080pa	13605pa
		17750as						21725as			
0700-0800 vl	Australia, VL8K Katherine	5025do				0800-0830	Australia, Radio	15415as	17715pa	17880as	
0700-0800 vl	Australia, VL8T Tent Crk	4910do				0800-0830 vl	Australia, VL8K Katherine	5025do			
0700-0800	Canada, CFCX Montreal	6005do				0800-0830 vl	Australia, VL8T Tent Crk	4910do			
0700-0800	Canada, CFRX Toronto	6070do				0800-0900 mtwhfta	Bhutan, Bhutan BC Service	5030do			
0700-0800	Canada, CFVP Calgary	6030do				0800-0900 vl	Canada, CBC N Quebec Svc	9625do			
0700-0800	Canada, CHNX Halifax	6130do				0800-0900	Canada, CFCX Montreal	6005do			
0700-0800	Canada, CKZU Vancouver	6160do				0800-0900	Canada, CFRX Toronto	6070do			
0700-0800	Costa Rica, RF Peace Intl	7385am	7585am			0800-0900	Canada, CFVP Calgary	6030do			
0700-0727	Czech Rep., Radio Prague	7345eu	9505eu			0800-0900	Canada, CHNX Halifax	6130do			
0700-0800	Ecuador, HCJB	9645pa	21455au			0800-0900	Canada, CKZU Vancouver	6160do			
0700-0800 as	Eqt Guinea, R East Africa	15186af				0800-0900	Costa Rica, RF Peace Intl	7385am	7585am		
0700-0800 mtwhft	Eqt Guinea, Radio Africa	15186af				0800-0900	Ecuador, HCJB	5865eu	9645pa	21455au	
0700-0715	Ghana, Ghana Broadc Corp	3366do	4915do			0800-0900 as	Eqt Guinea, R East Africa	15186af			
0700-0800	Guyana, GBC/Voice of	3290do				0800-0900 mtwhft	Eqt Guinea, Radio Africa	15186af			
0700-0800 vl	Italy, IRRS	3985va				0800-0830	Finland, YLE/R Finland	13645as	15235au		
0700-0800	Japan, R Japan/NHK World	7230eu	11740as	11840as	11850pa	0800-0805 s	Ghana, Ghana Broadc Corp	3366do			
		11910as	11920as	15230me	17810va	0800-0900	Guam, TWR/KTWR	15200as			
		17815af				0800-0900	Guyana, GBC/Voice of	3290do			
0700-0800 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do		0800-0900	Indonesia, Voice of	9525as			
0700-0800 vl	Kiribati, Radio	9810do				0800-0900 vl	Italy, IRRS	7125va			
0700-0800	Lebanon, Voice of Hope	9960va				0800-0900 vl	Kiribati, Radio	9810do			
0700-0715	Liberia, LCN/R Liberia Int	5100do				0800-0900	Lebanon, Voice of Hope	9960va			
0700-0800 asmtwh	Malaysia, Radio	7295do				0800-0900	Liberia, LCN/R Liberia Int	5100do			
0700-0800	Malaysia, Voice of	6175as	9750as	15295au		0800-0900	Malaysia, Radio	7295do			
0700-0800	Monaco, Trans World Radio	9755eu				0800-0825	Malaysia, Voice of	6175as	9750as	15295au	
0700-0758 as	New Zealand, R NZ Intl	9795pa				0800-0835 s	Monaco, Trans World Radio	9755eu			
0700-0800 mtwhft	New Zealand, R NZ Intl	9795pa				0800-0850 s	Monaco, Trans World Radio	9755eu			
0700-0800	Nigeria, Voice of	7255af				0800-0820 mtwhft	Monaco, Trans World Radio	9755eu			
0700-0750	North Korea, R Pyongyang	15340af	17765me			0800-0900	Netherlands, Radio	9720pa	9820pa		
0700-0730 s	Norway, Radio Norway Intl	15245me				0800-0816 mtwhft	New Zealand, R NZ Intl	9795pa			
0700-0800 vl	Papua New Guinea, NBC	9675do				0800-0850	North Korea, R Pyongyang	15180as	15230as		
0700-0745	Romania, R Romania Intl	15370pa	17720pa	17790pa	17805pa	0800-0830 s	Norway, Radio Norway Intl	15625as			
0700-0715 s	Romania, R Romania Intl	15370pa	17720pa	17790pa	17805pa	0800-0805	Pakistan, Radio	15465eu	17865eu		
0700-0800	Russia, Voice of Russia WS	15470pa	15490pa	15560va	17570au	0800-0900 as	Palau, KHBN/Voice of Hope	9730as			
		17610au	17795va			0800-0900 vl	Papua New Guinea, NBC	9675do			
0700-0710	Sierra Leone, SLBS	3316do				0800-0900	Russia, Voice of Russia WS	9810as	11800as	15470pa	15490pa
0700-0730	Slovakia, Adv World Radio	9440eu						15560va	17610au	17795va	
0700-0800 vl	Solomon Islands, SIBC	5020do	9545co			0800-0900 f	Seychelles, FEBA Radio	15540as			
0700-0800	Swaziland, Trans World R	9650af				0800-0810	Sierra Leone, SLBS	3316do			
0700-0800	Taiwan, VO Free China	5950na				0800-0900 vl	Solomon Islands, SIBC	5020do	9545do		
0700-0800	United Kingdom, BBC WS	6190af	7145as	7325eu	9410eu	0800-0900	South Korea, R Korea Intl	9570au	13670eu		
		9600af	9610af	9740as	11760as	0800-0805	Swaziland, Trans World R	4775af	9500af	9650af	
		11835af	11940af	11955as	12095va	0800-0900	United Kingdom, BBC WS	6190af	7325eu	9410eu	9740as
		15310as	15360as	15485af	15575va			11750as	11760as	11940af	11955as
		17640af	17760af	17785as	17830af			12095eu	15310as	15360va	15400af
		21660as						15485va	15575va	17640va	17760as
0700-0800 as	United Kingdom, BBC WS	17885af				0800-0900 as	United Kingdom, BBC WS	17785as	17830af	21660as	
0700-0715	United Kingdom, BBC WS	6005af	7160af			0800-0815	United Kingdom, BBC WS	15565va	17885af		
0700-0730	United Kingdom, BBC WS	6180eu	6195eu	7325af	9410eu	0800-0900	USA, KAIJ Dallas TX	7145pa	11835af		
		11780eu				0800-0900	USA, KNLS Anchor Point AK	5810am			
0700-0800	USA, KAIJ Dallas TX	5810am				0800-0900	USA, KTNB Salt Lk City UT	9615as			
0700-0800	USA, KTNB Salt Lk City UT	7510am				0800-0900	USA, KWHR Naalehu HI	7510am			
0700-0800	USA, KWHR Naalehu HI	9930au				0800-0900	USA, Monitor Radio Intl	9930as			
0700-0800	USA, Monitor Radio Intl	7535eu				0800-0900	USA, WEWN Birmingham AL	7535eu	9845au	15665eu	
0700-0800	USA, WEWN Birmingham AL	5825eu	6890na			0800-0900	USA, WHRI Noblesville IN	5825eu	7425na		
0700-0800	USA, WHRI Noblesville IN	5745am				0800-0900	USA, WJCR Upton KY	5745am	7315am		
0700-0800	USA, WJCR Upton KY	7490na				0800-0900	USA, WRNO New Orleans LA	7490na			
0700-0800 smtwhft	USA, WMLK Bethel PA	9465eu				0800-0900 as	USA, WVHA Greenbush ME	7355am			
0700-0800	USA, WRNO New Orleans LA	7355am				0800-0900	USA, WWCR Nashville TN	13825af			
0700-0800	USA, WWCR Nashville TN	2390am	3210am	5070am	5935am	0800-0900	USA, WYFR Okeechobee FL	2390am	3210am	5070am	5935am
0700-0800	USA, WYFR Okeechobee FL	7355eu	9985eu	13695af		0800-0830 vl	Vanuatu, Radio	3945do	7260do		
0700-0800 vl	Vanuatu, Radio	3945do	7260do			0800-0900	Zambia, Christian Voice	6065af			
0700-0800	Zambia, Christian Voice	6065af				0800-0900 vl	Zambia, R Zambia/ZNBC 1	7220do			
0700-0800 vl	Zambia, R Zambia/ZNBC 1	7220do				0800-0900 vl	Zimbabwe, Zimbabwe BC	5975do			
0700-0800 vl	Zimbabwe, Zimbabwe BC	5975do				0815-0900 mtwhft	Nigeria, FRCN/Radio	3326do	4770do	4990do	
0730-0755	Austria, R Austria Intl	6155eu	13730eu	15410me	17870me	0816-0900 mtwhft	New Zealand, R NZ Intl	6100pa			
0730-0800	Ecuador, HCJB	5865eu				0820-0900 vl	Chile, R Esperanza	6089am			
0730-0745 s	Greece, Voice of	7430eu	7450eu	9425au	11645eu	0830-0900 s	Armenia, Voice of	15270eu			
0730-0735	India, All India Radio	15185do	15260co			0830-0900 vl	Australia, VL8K Alice Spg	2310do			
0730-0800	Netherlands, Radio	9720pa	9820pa			0830-0900 vl	Australia, VL8K Katherine	2485do			
0730-0800 as	Palau, KHBN/Voice of Hope	9730as				0830-0900 vl	Australia, VL8T Tent Crk	2325do			
0730-0800	United Kingdom, BBC WS	15400va	15565va			0830-0900	Georgia, Radio	11910eu			
0740-0800	Guam, TWR/KTWR	15200as				0830-0840	India, All India Radio	7250do	15185do	15260do	
0745-0800 s	Ghana, Ghana Broadc Corp	3366do	4915do			0830-0900	Lithuania, Radio Vilnius	9710eu			
0745-0755	Greece, Voice of	7430eu	7450eu	9425au	11645eu	0830-0900	Slovakia, R Slovakia Intl	11990au	15460au	17570au	
0758-0800 as	New Zealand, R NZ Intl	6100pa				0830-0900	United Kingdom, BBC WS	15280as			
						0855-0900	Guam, TWR/KTWR	11830au			

FREQUENCIES

0900-1000	Anguilla, Caribbean Beacon	6090am				1000-1100	Anguilla, Caribbean Beacon	6090am			
0900-1000	Australia, Radio	9580pa	9860pa	13605as	21725as	1000-1100	Australia, Radio	9580pa	9710pa	9860pa	13605as
0900-1000 vl	Australia, VL8A Alice Spg	2310do						21725as			
0900-1000 vl	Australia, VL8K Katherine	2485do				1000-1100 vl	Australia, VL8A Alice Spg	2310do			
0900-1000 vl	Australia, VL8T Tent Crk	2325do				1000-1100 vl	Australia, VL8K Katherine	2485do			
0900-0925	Belgium, R Vlaanderen Int	6035eu	7190eu			1000-1100 vl	Australia, VL8T Tent Crk	2325do			
0900-1000	Canada, CFCX Montreal	6005do				1000-1100 vl	Canada, CBC N Quebec Svc	9625do			
0900-1000	Canada, CFRX Toronto	6070do				1000-1100	Canada, CFCX Montreal	6005do			
0900-1000	Canada, CFVP Calgary	6030do				1000-1100	Canada, CFRX Toronto	6070do			
0900-1000	Canada, CHNX Halifax	6130do				1000-1100	Canada, CFVP Calgary	6030do			
0900-1000	Canada, CKZU Vancouver	6160do				1000-1100	Canada, CHNX Halifax	6130do			
0900-0935 vl	Chile, R Esperanza	6089am				1000-1100	Canada, CKZU Vancouver	6160do			
0900-1000	China, China Radio Intl	9785pa	11755pa			1000-1100	China, China Radio Intl	9785pa	11755pa		
0900-1000	Costa Rica, RF Peace Intl	7385am	7585am			1000-1100	Costa Rica, RF Peace Intl	7385am	7585am		
0900-0927	Czech Rep, Radio Prague	15640me	17485af			1000-1100	Ecuador, HCJB	9645pa	21455au		
0900-1000	Ecuador, HCJB	9645pa	21455au			1000-1100	Ecuador, HCJB	9645pa	21455au		
0900-0930	Ecuador, HCJB	5865eu				1000-1100 as	Eqt Guinea, R East Africa	15186af			
0900-1000 as	Eqt Guinea, R East Africa	15186af				1000-1100 mtwhf	Eqt Guinea, Radio Africa	15186af			
0900-1000 mtwhf	Eqt Guinea, Radio Africa	15186af				1000-1100	Guam, AWR/KSDA	11790as			
0900-0950	Germany, Deutsche Welle	6160au	9565af	12025af	15410af	1000-1100	Guam, TWR/KTWR	9865as			
		17715au	17800af	21600af	21680au	1000-1100	India, All India Radio	11585as	13700as	15050as	17387au
		4915do						17840as			
0900-0915 mtwhf	Ghana, Ghana Broadc Corp	3366do				1000-1025	Israel, Kol Israel	15640eu			
0900-0955	Guam, TWR/KTWR	11835as				1000-1100 vl	Italy, IRRS	7125va			
0900-1000	Guyana, GBC/Voice of	3290do				1000-1100	Jordan, Radio	11690eu			
0900-0930 vl/m-f	Italy, IRRS	7125va				1000-1100	Lebanon, Voice of Hope	9960va			
0900-0930 vl	Kiribati, Radio	9810do				1000-1100	Malaysia, Radio	7295do			
0900-1000	Lebanon, Voice of Hope	9960va				1000-1100 vl	Malaysia, RTM Kuching	7160do			
0900-0915	Liberia, LCN/R Liberia Int	5100do				1000-1100 vl	Malaysia, RTM KotaKinabalu	5980do			
0900-1000	Malaysia, Radio	7295do				1000-1025	Netherlands, Radio	12065au	13710pa		
0900-0930	Mongolia, Voice of	15170as				1000-1100	New Zealand, R NZ Intl	6100pa			
0900-0925	Netherlands, Radio	9720pa	9820au	13700pa		1000-1100 as	Palau, KHBN/Voice of Hope	9730as			
0900-1000	New Zealand, R NZ Intl	6100pa				1000-1100 vl	Papua New Guinea, NBC	4890do			
0900-0930 s	Norway, Radio Norway Intl	13800as	15625au			1000-1100	Philippines, FEBC/R Intl	11635as			
0900-1000 as	Palau, KHBN/Voice of Hope	9730as				1000-1100	Russia, Voice of Russia WS	7330as	9800as	9810as	9835as
0900-1000 vl	Papua New Guinea, NBC	4890do						11655as	11800au	11880au	15170pa
0900-1000	Russia, Voice of Russia WS	9810as	11800as	11880as	17610au			15435pa	15490va	15510va	17560va
		17795va						17610va	17775va	17795va	
0900-1000	Slovakia, Adv World Radio	9450eu				1000-1100 vl	Solomon Islands, SIBC	5020do	9545do		
0900-0930	Switzerland, Swiss R Intl	9885au	13685au	17515au		1000-1030	Switzerland, Swiss R Intl	6165eu	9535eu		
0900-1000	United Kingdom, BBC WS	5965as	6190af	6195as	9410eu	1000-1100	United Kingdom, BBC WS	5965va	6190af	6195am	9410eu
		9740as	11750as	11765va	11940af			9740as	11750as	11760as	11765va
		11945as	12095eu	15190sa	15360as			11940af	12095eu	15310as	15485va
		15400af	15485va	15565as	15575va			15565as	15575me	17640af	17705af
		17640va	17705eu	17830af	21660as			17885va	21660as		
0900-0915	United Kingdom, BBC WS	7325eu	15310as	15360pa	17785as	1000-1100 as	United Kingdom, BBC WS	15190am	15400am	17830af	
0900-0945	United Kingdom, BBC WS	9580as	11760as	11955as	15280as	1000-1030	United Kingdom, BBC WS	15360as			
0900-1000	USA, KWHR Naalehu HI	9930as				1000-1100	USA, KAJI Dallas TX	5810am			
0900-1000	USA, KAJI Dallas TX	5810am				1000-1100	USA, KTNB Salt Lk City UT	7510am			
0900-1000	USA, KTNB Salt Lk City UT	7510am				1000-1100	USA, KWHR Naalehu HI	9930as			
0900-1000	USA, Monitor Radio Intl	7395sa	7535eu	9385au	15665as	1000-1100	USA, Monitor Radio Intl	6095na	7395sa	15665as	15725as
0900-1000	USA, WEWN Birmingham AL	5825eu	7425na			1000-1100	USA, Voice of America	5985pa	6165am	7405am	9590am
0900-1000	USA, WGTG McCaysville GA	9400am						11720as			
0900-1000	USA, WHRI Noblesville IN	5745am	7315am			1000-1100	USA, WEWN Birmingham AL	7425na			
0900-1000	USA, WJCR Upton KY	7490na				1000-1100	USA, WGTG McCaysville GA	9400am			
0900-1000 as	USA, WRMI/R Miami Intl	9955am				1000-1100	USA, WHRI Noblesville IN	6040am	9495am		
0900-1000	USA, WRNO New Orleans LA	7355am				1000-1100	USA, WJCR Upton KY	7490na			
0900-1000 as	USA, WVHA Greenbush ME	13825af				1000-1100	USA, WRMI/R Miami Intl	9955am			
0900-1000	USA, WWCR Nashville TN	2390am	3210am	5070am	5935am	1000-1100	USA, WRNO New Orleans LA	7355am			
0900-1000	Zambia, Christian Voice	6065af				1000-1100 as	USA, WVHA Greenbush ME	13825af			
0900-1000 vl	Zambia, R Zambia/ZNBC 1	7220do				1000-1100	USA, WWCR Nashville TN	2390am	5070am	5935am	15685am
0900-1000 vl	Zimbabwe, Zimbabwe BC	5975do				1000-1100	USA, WYFR Okeechobee FL	5950na			
0915-1000	Ghana, Ghana Broadc Corp	6130do	7295do			1000-1030 vl/m-f	Vatican State, Vatican R	5882eu	9645eu	11740eu	15595eu
0930-0955 mtwhf	Austria, R Austria Intl	15455au	17870au					17550eu			
0930-1000	Canada, CKZN St John's	6160do				1000-1030	Vietnam, Voice of	5940as	7270as	7400as	9840as
0930-1000	Georgia, Radio	11910me						12020as	15010as		
0930-1000	Netherlands, Radio	12065au	13710pa			1000-1100	Zambia, Christian Voice	6065af			
0930-1000	Philippines, FEBC/R Intl	11635as				1000-1100 vl	Zambia, R Zambia/ZNBC 1	7220do			
						1030-1055 s	Austria, R Austria Intl	15455au	17870au		
						1030-1057	Czech Rep, Radio Prague	7345eu	9505eu		
						1030-1100 mtwhf	Ethiopia, Radio	5990do	7110do	9705do	
						1030-1100	Guam, AWR/KSDA	15170as			
						1030-1100	Netherlands, Radio	6045eu	9860eu	12065as	13710as
						1030-1100	South Korea, R Korea Intl	11715am			
						1030-1100	Sri Lanka, Sri Lanka BC	11835as	17850as		
						1030-1055	UAE, Radio Dubai	13675eu	15395eu	17630eu	21605me

Hello, Writers...

Do you have a topic you've always "thought about" writing up for Monitoring Times? Now is the time! Given our full-spectrum coverage, plus the interest in new technology on the one hand and nostalgia for the past on the other, there is no limit to appropriate subject matter to write about. Bone up on your research, warm up your pen, and you, too, can earn a little spending money!

Pitch your idea to the editor at mteditor@grove.net or call 704-837-9200 and ask for Rachel. Writer's Guidelines are available on the MT homepage at www.grove.net, or for an SASE.

FREQUENCIES

1100-1200	Anguilla, Caribbean Beacon	11775am				1100-1200	Singapore, R Singapore Int	6015as	6155as		
1100-1200	Australia, Radio	9580pa	9770pa	9860pa	11660as	1100-1130	Solomon Islands, SIBC	5020do	9545do		
		13605as				1100-1130	Sri Lanka, Sri Lanka BC	11835as	17850as		
1100-1130	Australia, Radio	11640as				1100-1130	Switzerland, Swiss R Intl	13635as	15415as	17515as	
1100-1200 vl	Australia, VL8A Alice Spg	2310do				1100-1200	Taiwan, Voice of Asia	7445as			
1100-1200 vl	Australia, VL8K Katherine	2485do				1100-1200	United Kingdom, BBC WS	5965am	6190af	6195va	9410eu
1100-1200 vl	Australia, VL8T Tent Crk	2325do						9580as	11750as	11760as	11940af
1100-1200	Canada, CFCX Montreal	6005do						11955as	12095eu	15220am	15310as
1100-1200	Canada, CFRX Toronto	6070do						15485va	15565as	15575va	17640na
1100-1200	Canada, CFPV Calgary	6030do						17705eu	17830af	17885af	21660af
1100-1200	Canada, CHNX Halifax	6130do				1100-1130 as	United Kingdom, BBC WS	15190am			
1100-1200	Canada, CKZN St John's	6160do				1100-1130	United Kingdom, BBC WS	9700as	11765va	15310as	17785as
1100-1200	Canada, CKZU Vancouver	6160do				1100-1145	United Kingdom, BBC WS	15400af	17790as		
1100-1200	Costa Rica, Adv World R	5030am	6150am	7375am	9725am	1100-1200	USA, KAIJ Dallas TX	5810am			
		13750am				1100-1200	USA, KTVN Salt Lk City UT	7510am			
1100-1200	Costa Rica, RF Peace Intl	7385am	7585am			1100-1200	USA, KWHR Naalehu HI	9930as			
1100-1200	Ecuador, HCJB	12005am	15115am	21455au		1100-1200	USA, Monitor Radio Intl	6095na	7395sa	9355eu	9385au
1100-1200 as	Eqt Guinea, R East Africa	15186af						9430au			
1100-1200	Eqt Guinea, Radio Africa	9530as				1100-1200	USA, Voice of America	5985pa	6160as	9645as	9760as
1100-1150	Germany, Deutsche Welle	15370af	15410af	17765af	17800af			11720as	15160as	15425as	
1100-1200	Iran, VOIRI	7180me	9585af	11875me	15260af	1100-1200	USA, WEWN Birmingham AL	7425eu			
1100-1200 vl	Italy, IRRS	7125va				1100-1200	USA, WHRI Noblesville IN	6040am	9495am		
1100-1200	Japan, R Japan/NHK World	6120na	7125na	11815as		1100-1200	USA, WJCR Upton KY	7490na			
1100-1200	Jordan, Radio	11690eu				1100-1200	USA, WRMI/R Miami Intl	9955am			
1100-1200	Lebanon, Voice of Hope	9960va				1100-1200	USA, WRNO New Orleans LA	7355am			
1100-1110	Liberia, LCN/R Liberia Int	5100do				1100-1200 as	USA, WVHA Greenbush ME	13825eu			
1100-1200	Malaysia, Radio	7295do				1100-1200	USA, WWCR Nashville TN	2390am	5935am	7435am	15685am
1100-1200 vl	Malaysia, RTM Kuching	7160do				1100-1200	USA, WYFR Okeechobee FL	5950na	11830na		
1100-1200 vl	Malaysia, RTM Kota Kinabalu	5980do				1100-1130	Vietnam, Voice of	7285as	9730as		
1100-1200	Mozambique, Radio Maputo	11820af	11835af			1100-1200	Zambia, Christian Voice	6065af			
1100-1125	Netherlands, Radio	12065as	13710as			1100-1200 vl	Zambia, R Zambia/ZNBC 1	7220do			
1100-1200	New Zealand, R NZ Intl	6100pa				1104-1120	Pakistan, Radio	15465eu	17865eu		
1100-1150	North Korea, R Pyongyang	3560na	4404na	6575na	9975na	1120-1140	Australia, Defense Forces R	4763as			
		11335na				1130-1140	Lesotho, Radio Lesotho	4800do			
1100-1130 as	Palau, KHBN/Voice of Hope	9730as				1130-1200	Myanmar, Voice of	5990do			
1100-1200 vl	Papua New Guinea, NBC	4890do				1130-1200	Netherlands, Radio	6045eu	9860eu		
1100-1200	Russia, Voice of Russia WS	4740as	11655as	11880as	15170as	1130-1200	Sweden, Radio	11650na	15240na		
		15460as	15490as	15510as	15560as	1130-1200	United Kingdom, BBC WS	6195am	17705va		
		17560as	17610as	17755as	17775as	1130-1200 f	Vatican State, Vatican R	15595as	17550au		
		17795as				1135-1140	India, All India Radio	9595do	11620do	11710do	15185do

SELECTED PROGRAMS

Sundays

- 1100 Costa Rica, R for Peace Intl: The Far Right Radio Review.
 1100 USA, KAIJ Dallas TX: World University Network.
 1100 USA, KTVN Salt Lk City UT: Breakthrough.
 1130 Ecuador, HCJB Quito (am): The Christian's Hour.
 1130 UK, BBC London (AE): India: A People Partitioned (3rd, 10th).
 A look at India and Pakistan 50 years after independence.
 1130 USA, VOA Washington DC (as pac): Issues in the News.

Mondays

- 1100 New Zealand, Radio NZ Intl: Newsdesk (BBC).
 1103 North Korea, R Pyongyang: News.
 1110 USA, VOA Washington DC (as pac): American Gold.
 1115 Japan, Radio: 44 Minutes.
 1117 North Korea, R Pyongyang: Music.
 1126 North Korea, R Pyongyang: Commentary.
 1130 North Korea, R Pyongyang: Music of the Korean People's Army.
 1130 Singapore, R Singapore Intl: News.
 1131 Australia, Radio: Asia Focus.
 1133 North Korea, R Pyongyang: The Spirit of Socialist Korea.
 1134 Germany, Deutsche Welle: Africa Report.

Tuesdays

- 1100 Costa Rica, R for Peace Intl: Alternative Radio.
 1103 North Korea, R Pyongyang: News.
 1110 USA, VOA Washington DC (as pac): Now Music USA.
 1115 Japan, Radio: 44 Minutes.
 1115 North Korea, R Pyongyang: Music.
 1121 North Korea, R Pyongyang: The Immortal Story.
 1126 North Korea, R Pyongyang: Truth Idea.
 1130 New Zealand, Radio NZ Intl: On the March.
 1130 Singapore, R Singapore Intl: News.
 1131 Australia, Radio: Asia Focus.
 1134 Germany, Deutsche Welle: Africa Report.

Wednesdays

- 1100 Singapore, R Singapore Intl: News.
 1100 USA, WWCR #3 Nashville TN: Newswatch Magazine.

- 1103 North Korea, R Pyongyang: News.
 1109 Singapore, R Singapore Intl: Business and Market Report.
 1110 USA, VOA Washington DC (as pac): Now Music USA.
 1115 Japan, Radio: 44 Minutes.
 1115 Singapore, R Singapore Intl: Star Trax.
 1120 North Korea, R Pyongyang: The Reminiscences of the Great Leader.
 1130 Singapore, R Singapore Intl: News.
 1130 UK, BBC London (AF): Brain of Britain. Questions and answers as this popular quiz show continues.
 1131 Australia, Radio: Asia Focus.
 1139 North Korea, R Pyongyang: The Great Man of the Century.
 1144 Japan, Radio: Close Up.
 1151 Japan, Radio: Tumbling Dice.

Thursdays

- 1100 New Zealand, Radio NZ Intl: Newsdesk (BBC).
 1103 North Korea, R Pyongyang: News.
 1110 Australia, Radio: Sports Bulletin.
 1110 USA, VOA Washington DC (as pac): Now Music USA (Top Ten).
 1115 Japan, Radio: 44 Minutes.
 1117 North Korea, R Pyongyang: Music.
 1122 North Korea, R Pyongyang: Words of the Great Leader.
 1127 North Korea, R Pyongyang: Music.
 1130 New Zealand, Radio NZ Intl: Trading Post.
 1130 Singapore, R Singapore Intl: News.

Fridays

- 1100 New Zealand, Radio NZ Intl: Newsdesk (BBC).
 1100 USA, VOA Washington DC (as pac): VOA News.
 1103 North Korea, R Pyongyang: News.
 1106 Germany, Deutsche Welle: NewsL nk.
 1113 North Korea, R Pyongyang: Music.
 1115 Japan, Radio: 44 Minutes.
 1121 North Korea, R Pyongyang: Immortal Ideas of the Great Leader.
 1130 Singapore, R Singapore Intl: News.
 1130 USA, VOA Washington DC (as pac): Country Music USA.

- 1131 Australia, Radio: Asia Focus.
 1131 North Korea, R Pyongyang: Music.
 1138 North Korea, R Pyongyang: The Great Man of the Country.

Saturdays

- 1100 Costa Rica, R for Peace Intl: World of Radio.
 1100 Papua New Guinea, NBC: News.
 1103 North Korea, R Pyongyang: News.
 1105 Papua New Guinea, NBC: Top of the Pops.
 1105 Switzerland, Swiss Radio Intl: Newsnet.
 1113 North Korea, R Pyongyang: Music/Commentary.
 1130 Costa Rica, AWR: The Quiet Hour.
 1130 Costa Rica, R for Peace Intl: RFPI's Mailbag.
 1130 North Korea, R Pyongyang: All People Free.
 1130 Singapore, R Singapore Intl: News.
 1130 USA, VOA Washington DC (as pac): Press Conference USA.
 1135 North Korea, R Pyongyang: Music.

Macintosh Software

SHORTWAVE NAVIGATOR
FREQUENCY VALET • UTCLOCKFREQUENCIES/PROGRAMS/COMPUTER CONTROL
(DRAKE • KENWOOD • JRC)SEND \$2 FOR DEMO DISK TO:
DX COMPUTING • 232 SQUAW CREEK RD.
WILLOW PARK, TX 76087

FREQUENCIES

1200-1300	Anguilla, Caribbean Beacon	11775am				1200-1300	Singapore, R Singapore Int	6015as	6155as		
1200-1300	Australia, Radio	5995as	9580pa	9710as	9860pa	1200-1300	South Korea, R Korea Intl	7285af			
		11660as	13605as			1200-1300	Switzerland, Swiss R Intl	6165eu	9535eu		
1200-1300 vl	Australia, VL8A Alice Spg	2310do				1200-1300	Taiwan, VO Free China	7130au	9610as		
1200-1300 vl	Australia, VL8K Katherine	2485do				1200-1300	Ukraine, R Ukraine Intl	7150eu	7180eu	12045na	
1200-1300 vl	Australia, VL8T Bent Crk	2325do				1200-1300	United Kingdom, BBC WS	6190af	6195va	9410eu	9515am
1200-1300	Brazil, Radio Bras	15445na						9580as	9740as	11750as	11760as
1200-1230	Bulgaria, Radio	13790as						11940af	11955as	15220am	15310as
1200-1215	Cambodia, Natl Voice of	11940as						15485va	15565va	15575va	17640va
1200-1300 vl	Canada, CBC N Quebec Svc	9625do						17705af	17830af	17885af	21660af
1200-1300	Canada, CFCX Montreal	6005do				1200-1300	USA, KAIJ Dallas TX	5810am			
1200-1300	Canada, CFRX Toronto	6070do				1200-1300	USA, KTNB Salt Lk City UT	7510am			
1200-1300	Canada, CFVP Calgary	6030do				1200-1300	USA, KWHR Naalehu HI	9930as			
1200-1300	Canada, CHNX Halifax	6130do				1200-1300	USA, Monitor Radio Intl	6095na	9355as	9385au	9455sa
1200-1300	Canada, CKZN St John's	6160do				1200-1230	USA, Voice of America	6160as	9645as	9760as	11715as
1200-1300	Canada, CKZU Vancouver	6160do						15160as	15425as		
1200-1230	Canada, R Canada Intl	9660as	9715me	11835me	11975me	1200-1300	USA, WEWN Birmingham AL	7425sa			
		15195as				1200-1300	USA, WGTG McCaysville GA	9400am			
1200-1300	Canada, R Canada Intl	9640am	11855am	13650am		1200-1300	USA, WHRI Noblesville IN	6040am	9495am		
1200-1300	China, China Radio Intl	7385pa	9565pa	9715as	11795pa	1200-1300	USA, WJCR Upton KY	7490na			
1200-1230 vl	China, China Radio Intl	9660as	11700as	12110as		1200-1300	USA, WRMI/R Miami Intl	9955am			
1200-1300	Costa Rica, RF Peace Intl	7385am				1200-1300	USA, WRNO New Orleans LA	7355am			
1200-1300 vl	Cyprus, BRT International	6150do				1200-1300	USA, WWCR Nashville TN	7435am	9475am	13845am	15685am
1200-1300	Ecuador, HCJB	12005am	15115am	21455am		1200-1300	USA, WYFR Okeechobee FL	5950na	6015na	11830na	17750na
1200-1300 as	Eq Guinea, R East Africa	15186af				1200-1230	Uzbekistan, R Tashkent	7285as	9715as	15295as	
1200-1300	Eq Guinea, Radio Africa	9530as				1200-1300	Zambia, Christian Voice	6065af			
1200-1300	France, Radio France Intl	9805af	11600va	13625eu	15155eu	1200-1300 vl	Zambia, R Zambia/ZNBC 1	7220do			
		15195eu	15540af	17575af		1207-1300 occsnal	New Zealand, R NZ Intl	6100pa			
		7180me	9585me	11875me	15260af	1215-1300	Egypt, Radio Cairo	17595as			
1200-1230	Iran, VOIRI	7125va				1215-1300	United Kingdom, BBC WS	15220am			
1200-1300 vl	Italy, IRRS	7125as				1230-1255	Austria, R Austria Intl	6155eu	13730na		
1200-1300	Japan, R Japan/NHK World	11690eu				1230-1300	Bangladesh, Bangla Betar	7185as	9550as		
1200-1300	Jordan, Radio	9960va				1230-1255 s	Belgium, R Vlaanderen Int	13785na	15535as		
1200-1300	Lebanon, Voice of Hope	7295do				1230-1300 mtwhf	Finland, YLE/R Finland	11900na	15400na		
1200-1300	Malaysia, Radio	5980do				1230-1300	Guam, AWR/KSDA	13720as			
1200-1300 vl	Malaysia, RTM Kota Kinabalu	5990do				1230-1235	India, All India Radio	4860do	6150do	17860do	
1200-1250	Myanmar, Voice of	6045eu	9860eu			1230-1300 w	Indonesia, RRI Sorong	4875do			
1200-1300	Netherlands, Radio	6100pa				1230-1300	Mongolia, Voice of	12085as			
1200-1206	New Zealand, R NZ Intl	7255af				1230-1300	Romania, R Romania Intl	9690eu	11885eu	15365eu	17720eu
1200-1300	Nigeria, Voice of	9590eu	13800as	13805na	15605au	1230-1300	South Korea, R Korea Intl	9570as	9640as	13670as	
1200-1230 s	Norway, Radio Norway Intl	4890do				1230-1300 mtwhf	Sri Lanka, Sri Lanka BC	9730as			
1200-1300 vl	Papua New Guinea, NBC	6095eu	7145eu	7270eu	9525eu	1230-1300	Sweden, Radio	13740as	15240pa		
1200-1255	Poland, Polish R Warsaw	11815eu				1230-1300	Thailand, Radio	9655as	9885as	11850as	11905as
		4740as	4975as	11655as	11785as	1230-1300	Turkey, Voice of	13750eu	15290as		
1200-1300	Russia, Voice of Russia WS	11880as	15110as	15170as	15230as	1230-1300	Vietnam, Voice of	5940as	7270as	7400as	9840as
		15430as	15435as	15490as	15510as			12020as	15010as		
		17610as	17755as	17775as	17795as	1240-1250	Greece, Voice of	11645af			

SELECTED PROGRAMS

Sundays

1200	France, Radio France Intl: News.
1215	Singapore, R Singapore Intl: Frontiers.
1216	France, Radio France Intl: African Analysis (biweekly).
1216	France, Radio France Intl: Asian Analysis (biweekly).
1223	France, Radio France Intl: Paris Promenade.
1228	France, Radio France Intl: Counterpoint (biweekly).
1228	France, Radio France Intl: Everywoman (biweekly).
1230	Finland, Radio: News/Weather.
1230	Papua New Guinea, NBC: Classical Music Concert.
1234	France, Radio France Intl: Club 9516.
1235	Finland, Radio: Finnish Press Review.
1238	Finland, Radio: YLE Features.
1245	Finland, Radio: Starting Finnish.
1254	Finland, Radio: Nunti Latini.

Mondays

1200	Brazil, Radiobras: Brazilian Panorama.
1200	New Zealand, Radio NZ Intl: RNZ News.
1200	Papua New Guinea, NBC: News.
1204	Papua New Guinea, NBC: Music after Midnight.
1210	USA, VOA Washington DC (as pac): Stateside.
1215	Japan, Radio: Asian Top News.
1231	France, Radio France Intl: RFI Europe.
1238	France, Radio France Intl: News in Brief.
1239	Vietnam, Voice of Vietnam: Commentary.
1241	France, Radio France Intl: RFI Sports.
1247	France, Radio France Intl: Arts in France.

Tuesdays

1200	Canada, RCI Montreal: CBC Radio News.
1200	USA, VOA Washington DC (as pac): VOA News.

1205	USA, WWCR #3 Nashville TN: The Health and Home Show (live).
1210	USA, VOA Washington DC (as pac): Stateside.
1211	Canada, RCI Montreal: As It Happens.
1231	France, Radio France Intl: RFI Europe.
1236	France, Radio France Intl: Letter from a Listener.
1239	France, Radio France Intl: News Headlines.
1242	France, Radio France Intl: Books.
1249	France, Radio France Intl: Science Probe.

Wednesdays

1200	Brazil, Radiobras: Brazilian Panorama.
1200	Canada, RCI Montreal: CBC Radio News.
1200	France, Radio France Intl: News.
1200	Japan, Radio: News.
1200	USA, VOA Washington DC (as pac): VOA News.
1200	USA, WWCR #3 Nashville TN: UPI News.
1215	Taiwan, Voice of Free China: Music Box.
1231	France, Radio France Intl: RFI Europe.
1236	Finland, Radio: Finnish Press Review.
1238	France, Radio France Intl: News Headlines.
1242	France, Radio France Intl: The Bottom Line.
1247	France, Radio France Intl: Land of France.

Thursdays

1200	Brazil, Radiobras: Brazilian Panorama.
1200	Canada, RCI Montreal: CBC Radio News.
1200	France, Radio France Intl: News.
1211	Canada, RCI Montreal: As It Happens.
1220	Uzbekistan, Radio Tashkent: Life in the Village.
1222	Australia, Radio: Business Day.
1231	France, Radio France Intl: Sports.

1234	France, Radio France Intl: RFI Europe.
1241	France, Radio France Intl: News Headlines.
1244	France, Radio France Intl: The Americas Magazine.
1249	France, Radio France Intl: North/South (biweekly).
1249	France, Radio France Intl: Planet Earth (biweekly).

Fridays

1200	Brazil, Radiobras: Brazilian Panorama.
1200	Canada, RCI Montreal: CBC Radio News.
1210	USA, VOA Washington DC (as pac): Stateside.
1211	Canada, RCI Montreal: As It Happens.
1230	Finland, Radio: News/Weather.
1231	UK, BBC London (AF): Crossing the Border. See H 1515.
1231	France, Radio France Intl: RFI Europe.
1236	Finland, Radio: Finnish Press Review.
1239	France, Radio France Intl: News Headlines.
1240	Finland, Radio: YLE Features.
1241	France, Radio France Intl: Firm Reel.
1248	France, Radio France Intl: Made in France.

Saturdays

1200	Brazil, Radiobras: The Best of Brazilian Popular Music.
1200	France, Radio France Intl: News.
1200	Papua New Guinea, NBC: News.
1204	Papua New Guinea, NBC: Top of the Pops.
1210	USA, VOA Washington DC (as pac): On the Line.
1228	France, Radio France Intl: Spotlight on Africa.
1230	Singapore, R Singapore Intl: News.
1230	UK, BBC London (AS): Brain of Britain. See W 1130.
1230	USA, VOA Washington DC (as pac): Communications World.
1245	France, Radio France Intl: News Headlines.
1245	Singapore, R Singapore Intl: Arts Arena.
1247	France, Radio France Intl: French Lesson.

FREQUENCIES

1300-1400	Anguilla, Caribbean Beacon	11775am				1300-1330	Turkey, Voice of	13695eu	13750va	15290as		
1300-1400	Australia, Radio	5995pa	9580pa	9770pa	11800pa	1300-1400	United Kingdom, BBC WS	5990as	6190af	6195va	9410eu	
1300-1330	Australia, Radio	13605as						9515am	9740va	11750as	11760as	
1300-1400 vl	Australia, VL8A Alice Spg	2310do						11865am	11940af	12095eu	15220am	
1300-1400 vl	Australia, VL8K Katherine	2485do						15310as	15420af	15485va	15565as	
1300-1400 vl	Australia, V8T Tent Crk	2325do						15575va	17640va	17705af	17830af	
1300-1325 mtwhfa	Belgium, R Vlaanderen Int	13785as	15535as					17885af	21470af	21660af		
1300-1320	Brazil, Radio Bras	15445na				1300-1400	USA, KAIJ Dallas TX	13815am				
1300-1400 vl	Canada, CBC N Quebec Svc	9625do				1300-1400	USA, KNLS Anchor Point AK	7365as				
1300-1400	Canada, CFCX Montreal	6005do				1300-1400	USA, KTNB Salt Lk City UT	7510am				
1300-1400	Canada, CFRX Toronto	6070do				1300-1400	USA, KWHR Naalehu HI	9930as				
1300-1400	Canada, CFPV Calgary	6030do				1300-1400	USA, Monitor Radio Intl	6095na	9355as	9430as	9455am	
1300-1400	Canada, CHNX Halifax	6130do				1300-1330	USA, Voice of America	6160as	9645as	9760as	11715as	
1300-1400	Canada, CKZN St John's	6160do						15160as	15425as			
1300-1400	Canada, CKZU Vancouver	6160do				1300-1400	USA, WEWN Birmingham AL	7425na	11875na	15375sa	15745eu	
1300-1400 mtwhf	Canada, R Canada Intl	9640am	11855am	13650am		1300-1400	USA, WGTG McCaysville GA	9400am				
1300-1400 s	Canada, R Canada Intl	11855am	13650am			1300-1400	USA, WHRI Noblesville IN	6040am	15105am			
1300-1400	China, China Radio Intl	6140as	7385pa	7405as	9715as	1300-1400	USA, WJCR Upton KY	7490na				
		11660pa	11980as			1300-1400 mtwhf	USA, WRMI/R Miami Intl	9955am				
1300-1400	Costa Rica RF Peace Intl	7385am				1300-1400	USA, WRNO New Orleans LA	7355am				
1300-1330	Czech Rep, Radio Prague	13580eu	17485af			1300-1400 as	USA, WVHA Greenbush ME	15745na				
1300-1400	Ecuador, HCJB	12005am	15115am	21455am		1300-1400	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am	
1300-1330	Egypt, Radio Cairo	17595as				1300-1400	USA, WYFR Okeechobee FL	11830na	13695na	17750na	17750ca	
1300-1400 as	Eqt Guinea, R East Africa	15186af				1300-1400	Zambia, Christian Voice	6065af				
1300-1400	Eqt Guinea, Radio Africa	9530as				1300-1400 vl	Zambia, R Zambia/ZNBC 1	7220do				
1300-1330 vl	Italy, IRRS	7125va				1302-1400	USA, WYFR Okeechobee FL	11550as				
1300-1400	Jordan, Radio	11690eu				1330-1400	Canada, R Canada Intl	9535as	11795as	11935eu	15325me	
1300-1310	Liberia, LCN/R Liberia Int	5100do						17820af				
1300-1400	Malaysia, Radio	7295do				1330-1400	China, Heilongjiang PBS	4840do				
1300-1400 vl	Malaysia, RTM Kuching	7160do				1330-1400	Guam, AWR/KSDA	9650as				
1300-1400 vl	Malaysia, RTM Kota Kinabalu	5980do				1330-1400	India, All India Radio	9545as	11620as	13710as		
1300-1400 occsnal	New Zealand, R NZ Intl	6100pa				1330-1400 vl	Italy, IRRS	3985va				
1300-1400	Nigeria, Voice of	7255af				1330-1400	Netherlands, Radio	9890as	12090as	15585as		
1300-1350	North Korea, R Pyongyang	4405as	9345as	9640eu	11740as	1330-1400 vl	Pakistan, Radio	9485af	11565af	15595me		
		15230as				1330-1400 mtwhf	Portugal, R Portugal Intl	21515as				
1300-1400 vl	Papua New Guinea, NBC	4890do				1330-1400	Sweden, Radio	11650na	13740pa	15240na		
1300-1400	Philippines, FEBC/R Intl	11995as				1330-1355	UAE, Radio Dubai	15395eu	17630eu	21605me		
1300-1356	Romania, R Romania Intl	9690eu	11885eu	15365eu	17720eu	1330-1400	Uzbekistan, R Tashkent	7285as	9715as	15295as		
1300-1400	Russia, Voice of Russia WS	15430as	15460as	15560as	17610as	1330-1400	Vietnam, Voice of	5940eu	7270eu	7400eu	9840as	
		17795as						12020eu	15010as			
1300-1400	Singapore, R Singapore Int	6015as	6155as			1335-1345	Greece, Voice of	9375eu	15175na	15630na		
1300-1400 mtwhf	Sri Lanka, Sri Lanka BC	9730as				1345-1400	Vatican State, Vatican R	11625as	13765au			
1300-1330	Switzerland, Swiss R Intl	7230as	7480as	13635as	15120as	1350-1400	South Korea, KBS-1	3930do				
		15415as	17515as			1355-1400	Georgia, Voice of Hope	12120as				

SELECTED PROGRAMS

Sundays

- 1300 Australia, Radio: World and Australian News.
 1300 Singapore, R Singapore Intl: News.
 1300 USA, KNLS Anchor Point AK: Music/News/Commentary.
 1305 Switzerland, Swiss Radio Intl: Newsnet.
 1310 Australia, Radio: The Europeans.
 1310 USA, VOA Washington DC (as pac): Critic's Choice.
 1311 Russia, Voice of: Science and Engineering in the CIS.
 1330 UAE, Radio Dubai: News.
 1345 Vatican State, Vatican Radio: With Heart and Mind.
 1352 Vatican State, Vatican Radio: On-the-Air.

Mondays

- 1300 Philippines, FEBC: News Insight.
 1300 USA, VOA Washington DC (as pac): VOA News.
 1310 Australia, Radio: Dateline Asia Pacific.
 1310 Brazil, Radiobras: Brazilian Reporter.
 1330 Philippines, FEBC: World News Update.
 1330 Uzbekistan, Radio Tashkent: News.
 1335 Philippines, FEBC: News from the Philippines.
 1338 Netherlands, Radio: Newsline.
 1340 Philippines, FEBC: Computer Corner.
 1345 Vatican State, Vatican Radio: To the Ends of the Earth.
 1353 Netherlands, Radio: Research File.

Tuesdays

- 1300 Australia, Radio: World and Australia News and Sport.
 1300 Philippines, FEBC: News Insight.
 1310 Australia, Radio: Dateline Asia Pacific.
 1310 Brazil, Radiobras: Brazilian Reporter.
 1330 Philippines, FEBC: World News Update.
 1338 Netherlands, Radio: Newsline.
 1341 Canada, RCI Montreal: Spectrum.
 1345 Vatican State, Vatican Radio: A Room with a View of the Vatican.
 1354 Netherlands, Radio: Mirror Images.

- 1359 Vatican State, Vatican Radio: Ask the Abbot

Wednesdays

- 1300 Philippines, FEBC: News Insight.
 1305 Switzerland, Swiss Radio Intl: Newsnet.
 1315 Philippines, FEBC: FEBC DX Dial.
 1328 North Korea, R Pyongyang: The Reminiscences of the Great Leader.
 1330 India, All India Radio: News and Commentary.
 1330 Philippines, FEBC: World News Update.
 1335 Philippines, FEBC: News from the Philippines.
 1338 Netherlands, Radio: Newsline.
 1339 North Korea, R Pyongyang: The Great Man of the Century.
 1340 Philippines, FEBC: Computer Corner.
 1345 Vatican State, Vatican Radio: The Rome Report.
 1346 India, All India Radio: Indian Music.

Thursdays

- 1300 Philippines, FEBC: News Insight.
 1310 Australia, Radio: Dateline Asia Pacific.
 1310 Brazil, Radiobras: Brazilian Reporter.
 1330 Philippines, FEBC: World News Update.
 1330 UAE, Radio Dubai: News.
 1335 Philippines, FEBC: News from the Philippines.
 1340 Uzbekistan, Radio Tashkent: Correspondent Reports.
 1345 Vatican State, Vatican Radio: The Pope and the People.
 1350 Uzbekistan, Radio Tashkent: Life in the Village.
 1350 Vatican State, Vatican Radio: Pilgrim City.
 1352 Netherlands, Radio: Media Network.
 1359 Vatican State, Vatican Radio: Postcards from Rome.

Fridays

- 1300 Australia, Radio: World and Australia News and Sport.
 1300 Philippines, FEBC: News Insight.
 1310 Australia, Radio: Dateline Asia Pacific.

- 1310 Brazil, Radiobras: Brazilian Reporter.
 1330 Guam, AWR/KSDA: International Focus.
 1330 Philippines, FEBC: World News Update.
 1330 UAE, Radio Dubai: News.
 1342 Portugal, Radio Portugal Intl: Visitors' Notebook.
 1345 Vatican State, Vatican Radio: Then and Now.
 1346 Portugal, Radio Portugal Intl: Listeners Mailbag (triweekly).

Saturdays

- 1300 Australia, Radio: World and Australian News.
 1305 Singapore, R Singapore Intl: Chartbeat.
 1305 Switzerland, Swiss Radio Intl: Newsnet.
 1310 USA, VOA Washington DC (as pac): The American Agenda.
 1315 Switzerland, Swiss Radio Intl: Capital Letters (2/4).
 1330 Australia, Radio: Australia Today.
 1340 Philippines, FEBC: Computer Corner.
 1340 Singapore, R Singapore Intl: Regional Press Review.
 1345 Vatican State, Vatican Radio: By the Way.
 1351 Vatican State, Vatican Radio: Facing the Challenge.
 1355 Netherlands, Radio: Weekend.
 1356 Vatican State, Vatican Radio: What Can I Do?



Rob Green, host
of Radio
Netherlands'
"Press Review"
following
"Newsline"



FREQUENCIES

1400-1500	Anguilla, Caribbean Beacon	11775am				1400-1500	Sri Lanka, Sri Lanka BC	9730as			
1400-1500	Australia, Radio	5995pa	9580pa	9860pa	11800pa	1400-1430	Thailand, Radio	9955as	9830as	11905as	
1400-1430	Australia, Radio	9770pa				1400-1500	United Kingdom, BBC WS	5990as	6190af	6195as	9410eu
1400-1500 vl	Australia, VLBA Alice Spg	2310do						9515am	9740as	11750as	11865am
1400-1500 vl	Australia, VL8K Katherine	2485do						11940af	12095eu	15220am	15485va
1400-1500 vl	Australia, V18T Tent Crk	2325do						15565as	15575va	17640va	17830af
1400-1500 vl	Canada, CBC N Quebec Svc	9625do						17840am	21470af	21660af	
1400-1500	Canada, CFCX Montreal	6005do				1400-1500	USA, KAU Dallas TX	13815am			
1400-1500	Canada, CFRX Toronto	6070do				1400-1500	USA, KJES Mesquite NM	11715na			
1400-1500	Canada, CFVP Calgary	6030do				1400-1500	USA, KTVN Salt Lk City UT	7510am			
1400-1500	Canada, CHNX Halifax	6130do				1400-1500	USA, Monitor Radio Intl	9355as			
1400-1500	Canada, CKZN St John's	6160do				1400-1500	USA, Voice of America	6160as	7125as	7215as	9645as
1400-1500	Canada, CKZU Vancouver	6160do						9760as	15160as	15225va	15395as
1400-1500 s	Canada, R Canada Intl	11855am	13650am					15425as			
1400-1500	China, China Radio Intl	7160as	7405na	7405as	11825as	1400-1500	USA, WEWN Birmingham AL	9455na	11875na	15745eu	
1400-1500	Costa Rica, RF Peace Intl	7385am				1400-1500	USA, WGTG McCaysville GA	9400am			
1400-1500	Ecuador, HCJB	12005am	15115am	21455am		1400-1500	USA, WHRI Noblesville IN	6040am	15105am		
1400-1500 as	Eqt Guinea, R East Africa	15186af				1400-1500	USA, WJCR Upton KY	7490na			
1400-1500	France, Radio France Intl	11910as	15405me	17560me		1400-1500	USA, WRMI/R Miami Intl	9955am			
1400-1500	Georgia, Voice of Hope	12120as				1400-1500	USA, WRNO New Orleans LA	7355am			
1400-1500	India, All India Radio	9545as	11620as	13710as		1400-1500 as	USA, WVHA Greenbush ME	15745na			
1400-1430	Israel, Kol Israel	12090na	15650na			1400-1500	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
1400-1500 vl	Italy, IRRS	3985va				1400-1500	USA, WYFR Okeechobee FL	5950na	11550sa	11830na	17750ca
1400-1500	Japan, R Japan/NHK World	7200eu				1400-1405	Vatican State, Vatican R	11625as	13765au		
1400-1500	Jordan, Radio	11690eu				1400-1500	Zambia, Christian Voice	6065af			
1400-1500	Malaysia, Radio	7295do				1400-1500 vl	Zambia, R Zambia/ZNBC 1	4910do			
1400-1500	Malaysia, RTM Kuching	7160do				1415-1430 vl	Cyprus, BRT International	6150do			
1400-1500 vl	Malaysia, RTM Kota Kinabalu	5980do				1415-1427	Nepal, Radio	5005do	7165do		
1400-1430	Mexico, Radio Mexico Intl	9705na				1420-1500 as	Palau, KHBN/Voice of Hope	9985as			
1400-1500	Netherlands, Radio	9890as	12090as	15585as		1430-1500	Australia, Radio	6060pa	6080pa	9615as	9850pa
1400-1500 occasl	New Zealand, R NZ Intl	6100pa						11660as			
1400-1410	Pakistan, Radio	9485af	11565af	15595me		1430-1500	Guam, AWR/KSDA	7400as			
1400-1500 vl	Papua New Guinea, NBC	4890do				1430-1440	India, All India Radio	6150do	9565do	9835do	
1400-1500	Philippines, FEBC/R Intl	11995as				1430-1440 mtwhf	Indonesia, RRI Uj Pandang	4753do			
1400-1500	Russia, Voice of Russia WS	4740me	4940me	4975me	7345as	1430-1500	Romania, R Romania Intl	15335as	17720as		
		9595me	9800as	11665me	11835me	1430-1500 vl	Zambia, R Zambia/ZNBC 2	6165do			
		11985me	15350me	15430me	15540me	1440-1500	Myanmar, Voice of	5990do			
1400-1500	Singapore, R Corp of Sing	6155do									

SELECTED PROGRAMS

Sundays

- 1400 Australia, Radio: World and Asian News.
 1401 UK, BBC London (All): A Question of Science (3rd, 10th, 17th).
 John Wilson looks at how science affects every aspect of our lives.
 1416 France, Radio France Intl: Asian Analysis (biweekly).
 1422 France, Radio France Intl: Paris Promenade.
 1430 Philippines, FEBC: Far East Forum.
 1432 France, Radio France Intl: News in Brief.
 1432 Russia, Voice of: Kaleidoscope.
 1433 France, Radio France Intl: Club 9516.
 1439 Netherlands, Radio: Wide Angle.
 1445 Philippines, FEBC: Sound Words.
 1454 Netherlands, Radio: Siren Song.

Mondays

- 1400 Australia, Radio: World and Asian News.
 1411 Russia, Voice of: News and Views.
 1426 Australia, Radio: Around Australia.
 1430 Netherlands, Radio: News.
 1431 Australia, Radio: Innovations.
 1431 France, Radio France Intl: RFI Europe.
 1432 Russia, Voice of: Folk Box.
 1438 France, Radio France Intl: News in Brief.
 1438 Netherlands, Radio: Newslime.
 1440 France, Radio France Intl: RFI Sports.
 1445 UK, BBC London (AE/AF): The Lab: A new magazine program on science and technology for young people.
 1447 France, Radio France Intl: Arts in France.
 1454 Netherlands, Radio: A Good Life.

Tuesdays

- 1400 Australia, Radio: World and Asian News.
 1418 Australia, Radio: Business Day.
 1426 Australia, Radio: Around Australia.
 1431 Australia, Radio: Arts Australia.
 1431 France, Radio France Intl: France Today.
 1432 Russia, Voice of: Yours for the Asking.
 1433 France, Radio France Intl: RFI Europe.
 1441 France, Radio France Intl: News in Brief.
 1442 France, Radio France Intl: Books.
 1449 France, Radio France Intl: Science Probe.
 1454 Netherlands, Radio: Music 52-15.

Wednesdays

- 1400 Australia, Radio: World and Asian News.
 1401 Vatican State, Vatican Radio: What Can I Do?

- 1410 USA, VOA Washington DC (as pac): Asia Report.
 1411 Russia, Voice of: News and Views.
 1418 Australia, Radio: Business Day.
 1426 Australia, Radio: Around Australia.
 1431 Australia, Radio: Science File.
 1431 France, Radio France Intl: RFI Europe.
 1432 Russia, Voice of: The Jazz Show.
 1441 France, Radio France Intl: News in Brief.
 1443 France, Radio France Intl: The Bottom Line.
 1446 France, Radio France Intl: Land of France.

Thursdays

- 1400 Australia, Radio: World and Asian News.
 1400 USA, VOA Washington DC (as pac): VOA News.
 1426 Australia, Radio: Around Australia.
 1431 France, Radio France Intl: Sports.
 1435 France, Radio France Intl: RFI Europe.
 1441 France, Radio France Intl: News in Brief.
 1443 France, Radio France Intl: North/South (biweekly).
 1443 France, Radio France Intl: Planet Earth (biweekly).
 1443 France, Radio France Intl: The Americas Magazine (5).
 1448 France, Radio France Intl: Made in France.
 1453 Netherlands, Radio: Research File.

Fridays

- 1400 Australia, Radio: World and Asian News.
 1418 Australia, Radio: Business Day.
 1426 Australia, Radio: Around Australia.
 1431 France, Radio France Intl: RFI Europe.
 1432 Russia, Voice of: Music at Your Request.
 1438 Netherlands, Radio: Newslime.
 1439 France, Radio France Intl: News in Brief.
 1441 France, Radio France Intl: Film Reel.
 1446 France, Radio France Intl: Silk Roads (biweekly).
 1454 Netherlands, Radio: Documentary.

Saturdays

- 1400 Australia, Radio: World and Asian News.
 1400 Vatican State, Vatican Radio: Faith by Numbers.
 1411 Russia, Voice of: News and Views.
 1425 France, Radio France Intl: Focus on France.
 1430 Netherlands, Radio: News.
 1430 USA, WHRI Noblesville IN (Angel 2): DXing with Cumbre.
 1432 Russia, Voice of: Timelines.
 1434 France, Radio France Intl: Asia File.
 1438 Netherlands, Radio: Newslime.
 1440 Philippines, FEBC: Mailbag.

- 1454 Netherlands, Radio: Roughly Speaking.
 1455 Philippines, FEBC: FEBC DX Dial.

HAUSER'S HIGHLIGHTS RUSSIA : R. STANTSIYA TIKHIY OKEAN, VLADIVOSTOK

Daily 0715-0800 UTC
 15490, 12070, 12055, 10344-USB.
 9825, 9670, 7490-USB, 7210, 7185
 kHz

1800-1845 UTC
 11655, 9895, 9735 kHz

May also be relayed via Khabarovsk,
 Magadan, Yuzhno-Sakhalinsk
 (BBC Monitoring)

Low-power regional stations:

4040 5 kW Tura 2100-1900
 4485 17 kW Ufa 2300-2100
 4520 2 kW Palana 1700-1500
 5290 5 kW Perm 2300-1430
 7200 5 kW Yoshkar-Ola 0100-1500
 not to be confused with...
 7200 100 kW Yakutsk
 1900-1700

11650 5 kW Perm 1500-2100
 11840 15 kW Yuzhno-Sakhalinsk
 1700-1500

15165 5 kW Yoshkar-Ola 1530-2300
 all one hour later Nov-Mar;
 relay R. Rossii when not carrying their
 own programs
 (Nikolai Rudnev, Russia, BC-DX)



FREQUENCIES

[illegible]

SELECTED PROGRAMS

Sundays

1500 Ecuador, HCJB Quito (am): Encounter.
1500 Jordan, Radio: Listeners' Choice.
1510 USA, VOA Washington DC (as): New Horizons.
1515 UK, BBC London (AFL): Cpera of the Week. The summer replacement for Concert Hall.
1530 Australia, Radio: Fine Music Australia.
1530 USA, VOA Washington DC (as): News (Special English).
1532 Russia, Voice of: Moscow Yesterday and Today.
1540 USA, VOA Washington DC (as): Words and their Stories (Special English).
1545 USA, VOA Washington DC (as): People in America (Special English).

Mondays

1500 Jordan, Radio: Program Review.
1500 USA, VOA Washington DC (as): VOA News.
1500 USA, WGTG, McCaysville GA: Larry Nichols (live).
1503 Jordan, Radio: Music.
1506 USA, WWCR #3 Nashville TN: Freedom's Call (live).
1511 Russia, Voice of: Moscow Mailbag.
1515 Japan, Radio: Asian Top News.
1532 Russia, Voice of: This is Russia.

Tuesdays

1500	USA, WGTG, McCaysville GA: Larry Nichols (live).
1502	Jordan, Radio: Women.
1506	USA, WVCR #3 Nashville TN: Freedom's Call (live).
1511	Russia, Voice of: Focus on Asia and the Pacific.
1515	Japan, Radio: Asian Top News.
1530	Jordan, Radio: Pop Breaker.
1530	Philippines, FBBC : World News Update.
1530	USA, VOA Washington DC (as): News (Special English).
1540	USA, VOA Washington DC (as): Agriculture Report (Special English).
1545	USA, VOA Washington DC (as): Science in the News (Special English).

Wednesdays

1500 USA, WGTG: McCalysville GA: Larry Nichols (live).
1502 Jordan, Radio: Jordan Weekly.
1506 USA, WWCW #3 Nashville TN: Freedom's Call (live).
1510 Australia, Radio: Asia Focus.
1511 Russia, Voice of: Focus on Asia and the Pacific.
1515 Japan, Radio: Asian Top News.
1530 USA, VOA Washington DC (as): News (Special English).
1531 Australia, Radio: Australia Today.
1540 USA, VOA Washington DC (as): Science Report (Special English).
1545 USA, VOA Washington DC (as): Exploration (Special English).
1555 Vatican State, Vatican Radio: Mailbox

Thursdays

1500	Japan, Radio: News.
1500	USA. WGTG. McCaysville GA: Larry Nichols (live).
1502	Jordan, Radio: New Horizons.
1506	USA, WWCW #3 Nashville TN: Freedom's Call (live).
1511	Russia, Voice of: Focus on Asia and the Pacific.
1515	Japan, Radio: Asian Top News.
1515	UK, BBC London (AE): Crossing the Border. Ancient and modern musical traditions are being blended in Western and non-Western music.
1530	USA, VOA Washington DC (as): News (Special English).
1532	Jordan, Radio: Pop Session.
1540	USA, VOA Washington DC (as): Science Report (Special English).
1545	USA, VOA Washington DC (as): The Making of a Nation (Special English).

Fridays

1500 USA, WGTG, McCaysville GA: Larry Nichols (live).
1502 Jordan, Radio: In Concert.
1506 USA, WWCR #3 Nashville TN: Freedom's Call (live).

1511	Russia, Voice of: Focus on Asia and the Pacific.
1515	Japan, Radio, Asian Top News.
1530	Philippines, FEBC : World News Update.
1530	USA, VOA Washington DC (as): News (Special English).
1540	USA, VOA Washington DC (as): Environment Report (Special English).
1545	USA, VOA Washington DC (as): American Mosaic (Special English).
1550	Vatican State, Vatican Radio: News from the African Church.

Saturdays

1500	Australia, Radio: World and Australian News.
1500	Japan, Radio: News.
1500	Jordan, Radio: Program Review.
1502	Jordan, Radio: Jordan Weekly.
1510	Australia, Radio: Oz Sounds #1.
1510	Japan, Radio: Asia Weekly.
1510	USA, VOA Washington DC (as): Agriculture Today.
1510	USA, VOA Washington DC (me): The American Agenda.
1511	Russia, Voice of: Focus on Asia and the Pacific.
1530	USA, VOA Washington DC (me): News (Special English).
1540	USA, VOA Washington DC (me): In the News (Special English).
1545	USA, VOA Washington DC (me): American Stories (Special English).

FREQUENCIES

1600-1700	Algeria, R. Algiers Intl	11715af	15160me	15205af	1600-1640	UAE, Radio Dubai	15395me	17630eu		
1600-1700	Anguilla, Caribbean Beacon	11775am			1600-1700	United Kingdom, BBC WS	3255af	3915as	5975as	6190af
1600-1700	Australia, Radio	5995pa	6060pa	6080pa			7160as	9410eu	11750as	12095eu
		9615pa	9850pa	9860pa			15400af	15485eu	15565me	15575va
		11800pa	12080pa	11660pa			17830af	17840am	21470af	21660af
1600-1700 vl	Australia, VL8A Alice Spg	2310do			1600-1615	United Kingdom, BBC WS	5990as	6195as	9515am	9740as
1600-1700 vl	Australia, VL8K Katherine	2485do			1600-1700	USA, KAU Dallas TX	13815am			
1600-1700 vl	Australia, VL8T Tent Crk	2325do			1600-1700	USA, KTNB Salt Lk City UT	15590am			
1600-1610	Bangladesh, Bangla Betar	4880do	15520do		1600-1700	USA, KWHR Naalehu HI	9930as			
1600-1700 vl	Canada, CBC N Quebec Svc	9625do			1600-1700	USA, Monitor Radio Intl	18930af			
1600-1700	Canada, CFCX Montreal	6005do			1600-1700	USA, Voice of America	6035af	6110as	6160as	7125as
1600-1700	Canada, CFRX Toronto	6070do					7215as	9645as	9700me	9760as
1600-1700	Canada, CFVP Calgary	6030do					13600af	13710af	15205va	15225af
1600-1700	Canada, CHNX Halifax	6130do					15255va	15395as	15410af	15445af
1600-1700	Canada, CKZN St John's	6160do					17895af			
1600-1700	Canada, CKZU Vancouver	6160do			1600-1700	USA, WEWN Birmingham AL	11875na	13615na	15745eu	
1600-1700	China, China Radio Intl	15110af	15130af		1600-1700	USA, WGTG McCaysville GA	9400am			
1600-1700 as	Costa Rica, Adv World R	9725am	11870am	13750am	1600-1700	USA, WHRI Noblesville IN	13760am	15105am		
1600-1700	Costa Rica, RF Peace Intl	7385am			1600-1700	USA, WJCR Upton KY	7490na			
1600-1627	Czech Rep, Radio Prague	5930eu	17485af		1600-1700 smtwhf	USA, WMLK Bethel PA	9465eu			
1600-1700	Ethiopia, Radio	7165af	9560af	11800af	1600-1700 mtwhf	USA, WRMI/R Miami Intl	9955am			
1600-1700	France, Radio France Intl	11615me	11700af	12015af	1600-1700	USA, WRNO New Orleans LA	7355am			
		15460af	15530af	15210af	1600-1700	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
1600-1650	Germany, Deutsche Welle	6170as	7185af	7225as	1600-1700	USA, WYFR Okeechobee FL	11705na	11830na	15695eu	17750eu
		9875as	11810af	13690as			21525af	21745eu		
1600-1630	Guam, TWR/KTWR	11580as			1600-1610	Vatican State, Vatican R	9940as	11635as		
1600-1630	Iran, VOIRI	7215as	9550as		1600-1630	Vatican State, Vatican R	4005eu	5882eu	7250eu	9645eu
1600-1700 vl	Italy, IRRS	3985va					11810eu			
1600-1630	Jordan, Radio	11690eu			1600-1630	Vietnam, Voice of	9840af	15010af		
1600-1610	Lesotho, Radio Lesotho	4800do			1600-1700	Zambia, Christian Voice	3330af	4965af		
1600-1700	Malaysia, Radio	7295do			1600-1700 vl	Zambia, R Zambia/ZNBC 1	4910do			
1600-1650 occsnal	New Zealand, R NZ Intl	6100pa			1600-1700 vl	Zambia, R Zambia/ZNBC 2	6165do			
1600-1630	Pakistan, Radio	9485af	11565as	11935as	1610-1615	Bangladesh, Bangla Betar	4880do			
		15595me			1610-1700	USA, WYFR Okeechobee FL	11550as			
1600-1700 vl	Papua New Guinea, NBC	4890do			1615-1700 as	United Kingdom, BBC WS	9515am	11860af	15420af	
1600-1700	Russia, Voice of Russia WS	7345as	7440eu	9440af	1630-1655	Austria, R Austria Intl	6155eu	9655eu	11855me	13710as
		9615af	9635af	9675eu			13730af			
		9765af	9775eu	9880af	1630-1657	Canada, R Canada Intl	7150as	9550as		
		11665me	11675af	11685me	1630-1700	Egypt, Radio Carro	15255af			
		11775va	11835va	11850va	1630-1700	Georgia, Radio	6180eu			
		11985va	12025va	15350va	1630-1700	Slovakia, Adv World Radio	11600as	13580me		
		15430eu	15540va	15400eu	1630-1700	Slovakia, R Slovakia Intl	5915eu	6055eu	7345eu	
		6120af	9685af	17875va	1645-1700 irreg	Afghanistan, Radio	7200as			
1600-1630	S Africa, Channel Africa	6120af			1645-1700	Tajikistan, Radio Dushanbe	7245as	9905as		
1600-1700	Singapore, R Corp of Sing	6155do			1650-1700	Eqt Guinea, Radio Africa	15186af			
1600-1700	South Korea, R Korea Intl	5975eu	9515af	9870af	1650-1700 mtwhf	New Zealand, R NZ Intl	6145pa			
1600-1700	Swaziland, Trans World R	9500af								
1600-1630	Switzerland, Swiss R Intl	12075as	13635as	15530as						

SELECTED PROGRAMS

Sundays

1600	Jordan, Radio: News Summary.
1603	Jordan, Radio: Listeners' Choice.
1605	Switzerland, Swiss Radio Intl: Newsnet.
1611	Russia, Voice of: Moscow Mailbag.
1615	UK, BBC London (AF) Opera of the Week. See S 1515
1619	France, Radio France Intl: Everywoman (biweekly).
1619	France, Radio France Intl: Health Concerns (biweekly).
1622	France, Radio France Intl: Paris Promenade.
1626	France, Radio France Intl: Echoes from Africa (biweekly).
1631	France, Radio France Intl: News Headlines.
1632	France, Radio France Intl: Club 9516.
1632	Russia, Voice of: Timelines.

Mondays

1600	Jordan, Radio: News Summary.
1602	Vatican State, Vatican Radio: News.
1604	Jordan, Radio: On the Air if You Dare.
1606	Germany, Deutsche Welle: NewsLink.
1610	USA, VOA Washington DC (as): Mideast Edition.
1611	Russia, Voice of: Newmarket.
1630	USA, VOA Washington DC (me): American Gold.
1631	France, Radio France Intl: RFI Europe.
1632	Russia, Voice of: This is Russia.
1638	France, Radio France Intl: News Headlines.
1640	France, Radio France Intl: RFI Sports.
1647	France, Radio France Intl: Arts in France.

Tuesdays

1600	Jordan, Radio: News Summary.
1602	Vatican State, Vatican Radio: News.
1604	Jordan, Radio: Classical Jam.
1610	USA, VOA Washington DC (as): Mideast Edition.

1611	Russia, Voice of: Science and Engineering in the CIS.
1615	Vatican State, Vatican Radio: News.
1630	USA, VOA Washington DC (as): Now Music USA.
1633	France, Radio France Intl: RFI Europe.
1640	France, Radio France Intl: News Headlines.
1642	France, Radio France Intl: Books.
1647	France, Radio France Intl: Drumbeat.

Wednesdays

1600	Jordan, Radio: News Summary.
1604	Jordan, Radio: The Mix.
1605	Switzerland, Swiss Radio Intl: Newsnet.
1606	Germany, Deutsche Welle: NewsLink.
1610	USA, VOA Washington DC (as): Mideast Edition.
1611	Russia, Voice of: Science and Engineering in the CIS.
1630	USA, VOA Washington DC (as): Now Music USA.
1631	France, Radio France Intl: RFI Europe.
1633	Germany, Deutsche Welle: Africa Report.
1638	France, Radio France Intl: News Headlines.
1641	France, Radio France Intl: The Bottom Line.
1646	France, Radio France Intl: Land of France.

Thursdays

1600	Germany, Deutsche Welle: News.
1600	Jordan, Radio: News Summary.
1603	Jordan, Radio: Country Music.
1606	Germany, Deutsche Welle: NewsLink.
1611	Russia, Voice of: Moscow Mailbag.
1630	France, Radio France Intl: Sports.
1630	UK, BBC London (AS): The Lab. See M 1445.
1632	France, Radio France Intl: RFI Europe.
1632	Russia, Voice of: Moscow Yesterday and Today.
1639	France, Radio France Intl: News Headlines.

1641	France, Radio France Intl: North/South (biweekly).
1641	France, Radio France Intl: Planet Earth (biweekly).
1646	France, Radio France Intl: Science Probe.

Fridays

1600	Jordan, Radio: News Summary.
1602	Vatican State, Vatican Radio: News.
1604	Jordan, Radio: Country Music.
1610	USA, VOA Washington DC (as): Mideast Edition.
1630	USA, VOA Washington DC (as): Country Music USA.
1630	USA, VOA Washington DC (me): Now Music USA (Top 20 Countdown).
1631	France, Radio France Intl: RFI Europe.
1632	Russia, Voice of: Your Top Tune.
1638	France, Radio France Intl: News Headlines.
1641	France, Radio France Intl: Film Reel.
1646	France, Radio France Intl: Made in France.
1647	Russia, Voice of: You Write to Moscow.

Saturdays

1600	Jordan, Radio: News Bulletin.
1600	USA, VOA Washington DC (as): VOA News.
1605	Switzerland, Swiss Radio Intl: Newsnet.
1610	Australia, Radio: Asia Focus.
1610	USA, VOA Washington DC (as): On the Line.
1611	Russia, Voice of: Music and Musicians.
1613	Jordan, Radio: Music.
1614	France, Radio France Intl: Focus on France.
1615	Switzerland, Swiss Radio Intl: Capital Letters (2/4).
1630	USA, VOA Washington DC (af): News Summary.
1630	USA, VOA Washington DC (as): Press Conference USA.
1631	France, Radio France Intl: Spotlight on Africa.
1645	France, Radio France Intl: French Lesson.



FREQUENCIES

1700-1800	Anguilla, Caribbean Beacon	11775am				1800-1900	Anguilla, Caribbean Beacon	11775am			
1700-1800	Australia, Radio	6060pa	6080pa	9580pa	9615as	1800-1900	Australia, Radio	6080as	7240pa	7330as	9580pa
		9860pa	11880pa	12080pa				9615as	9860pa	11880pa	12080pa
1700-1830 vl	Australia, VL8A Alice Spg	2310do				1800-1900 vl	Australia, VL8A Alice Spg	2310do			
1700-1830 vl	Australia, VL8K Katherine	2485do				1800-1900 vl	Australia, VL8K Katherine	2485do			
1700-1830 vl	Australia, VL8T Tent Crk	2325do				1800-1900 vl	Australia, VL8T Tent Crk	2325do			
1700-1830 vl	Canada, CBC N Quebec Svc	9625do				1800-1900	Bangladesh, Bangla Betar	7190eu	9570as	15520do	
1700-1830	Canada, CFCX Montreal	6005do				1800-1825 mtwhf	Belgium, R Vlaanderen Int	5910eu	13645af		
1700-1830	Canada, CFRX Toronto	6070do				1800-1900	Brazil, Radio Bras	15265eu			
1700-1830	Canada, CFVP Calgary	6030do				1800-1900	Canada, CFCX Montreal	6005do			
1700-1830	Canada, CHNX Halifax	6130do				1800-1900	Canada, CFRX Toronto	6070do			
1700-1830	Canada, CKZN St John's	6160do				1800-1900	Canada, CFVP Calgary	6030do			
1700-1830	Canada, CKZU Vancouver	6160do				1800-1900	Canada, CHNX Halifax	6130do			
1700-1830	China, China Radio Intl	5220af	7150af	7160af	7405af	1800-1900	Canada, CKZN St John's	6160do			
		11910af				1800-1900	Canada, CKZU Vancouver	6160do			
		15050am				1800-1900	Costa Rica, RF Peace Intl	15050am			
1700-1727	Czech Rep, Radio Prague	5930eu	15640af			1800-1900	Egypt, Radio Cairo	15255af			
1700-1800	Egypt, Radio Cairo	15255af				1800-1830	Egt Guinea, Radio Africa	15186af			
1700-1800	Egt Guinea, Radio Africa	15186af				1800-1900	Georgia, Voice of Hope	9310eu			
1700-1730	France, Radio France Intl	15210af	15460me			1800-1900	India, All India Radio	7410eu	9650eu	9950af	11620af
1700-1800	Georgia, Voice of Hope	9310eu						11935me	13770as	13780as	15075as
1700-1800	Japan, R Japan/NHK World	6035na	7110na	7200na	7225na	1800-1900 vl	Italy, IRRS	3985va			
		9535na	9835na	11730as	11880as	1800-1900 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
		6145pa				1800-1900	Kuwait, Radio	11990na			
1700-1800 mtwhf	New Zealand, R NZ Intl	4405eu	9325eu	9640af	9975af	1800-1900 s	Morocco, RTVM Marocaine	17815af			
1700-1750	North Korea, R Pyongyang	13785me				1800-1900	Mozambique, Radio Maputo	3265af	4855af		
		4890do				1800-1825	Netherlands, Radio	6020af	7120af	11655af	
1700-1800 vl	Papua New Guinea, NBC	6000eu	6095eu	7285eu		1800-1900 mtwhf	New Zealand, R NZ Intl	6145pa			
1700-1755	Poland, Polish R Warsaw	7345va	7440eu	9440af	9615af	1800-1830 s	Norway, Radio Norway Intl	7485eu	9590me	15220af	
1700-1800	Russia, Voice of Russia WS	9675eu	9765eu	9775eu	9890af	1800-1900 vl	Papua New Guinea, NBC	4890do			
		9975af	11685me	11725me	11775va	1800-1900 vl	Philippines, R Pilipinas	11720me	11890me	15190me	
		11850va	11945va	12025va	15350va			7290af	7350af	7440eu	9440af
		15400va	17525va	17875va		1800-1900	Russia, Voice of Russia WS	9775af	9785af	9880eu	9945eu
		11900af						9975eu	11775va	15400eu	17875eu
1700-1730	S Africa, Channel Africa	7265as	9475af	15620me		1800-1900	S Africa, World Music R	3345as			
1700-1730	Slovakia, Adv World Radio	9620eu				1800-1900	Sudan, Radio Omdurman	9200af			
1700-1730	Spain, R Exterior Espana	9905eu				1800-1900	Swaziland, Trans World R	3200af			
1700-1730	Switzerland, Swiss R Intl	3255af	5975as	6090va	6190af	1800-1830	Swaziland, Trans World R	9500af			
1700-1803	United Kingdom, BBC WS	6195eu	7160as	9410eu	9510as	1800-1900	United Kingdom, BBC WS	3255af	6180eu	6190af	6195eu
		11750as	12095eu	15400af	15420af			9410va	12095eu	15400af	15420af
		15485eu	15575va	17830af	17840af			15485va	15575va	17830af	
		3915as	9630af	11860af		1800-1830	United Kingdom, BBC WS	5975as	6090va	9510as	21490af
1700-1745	United Kingdom, BBC WS	13815am				1800-1900	USA, KAIJ Dallas TX	13815am			
1700-1800	USA, KAIJ Dallas TX	15590am				1800-1900	USA, KJES Mesquite NM	15385na			
1700-1800	USA, KTNB Salt Lk City UT	9930as				1800-1900	USA, KTNB Salt Lk City UT	15590am			
1700-1800	USA, KWHR Naalehu HI	18930af				1800-1900	USA, KWHR Naalehu HI	13625au			
1700-1800	USA, Monitor Radio Intl	6110as	6160as	7125as	7170as	1800-1900	USA, Monitor Radio Intl	9385af	13770eu	15665eu	18930af
1700-1800	USA, Voice of America	9645as	9700me	9760af	15255va	1800-1900	USA, Voice of America	7415af	9760af	11975af	15410af
		15395as	15445af	17895af				15580af	17895af		
		5990as	6045as	7150as	9550as	1800-1900	USA, WEWN Birmingham AL	11875na			
		9770as	11870as	15135as		1800-1900	USA, WGTG McCaysville GA	9400am			
1700-1800 mtwhf	USA, Voice of America	11875na	13615na	15745eu		1800-1900	USA, WHRI Noblesville IN	9495am	13760eu		
1700-1800	USA, WEWN Birmingham AL	9400am				1800-1900	USA, WINB Red Lion PA	15715af			
1700-1800	USA, WGTG McCaysville GA	9495am	13760am			1800-1900	USA, WJCR Upton KY	7490na			
1700-1800	USA, WHRI Noblesville IN	15715af				1800-1900	USA, WJCR Upton KY	9465eu			
1700-1800	USA, WINB Red Lion PA	7490na				1800-1900 smtwhf	USA, WMLK Bethel PA	9955am			
1700-1800	USA, WJCR Upton KY	9465eu				1800-1900 as	USA, WRMI/R Miami Intl	7355am			
1700-1800 smtwhf	USA, WMLK Bethel PA	9955am				1800-1900	USA, WRNO New Orleans LA	11580af			
1700-1800 mtwhf	USA, WRMI/R Miami Intl	7355am				1800-1900 smtwhf	USA, WVHA Greenbush ME	9475am			
1700-1800	USA, WRNO New Orleans LA	11580af				1800-1900	USA, WWCN Nashville TN	11550as	12160am	13845am	15685am
1700-1800 mtwhf	USA, WVHA Greenbush ME	9475am	12160am	13845am	15685am	1800-1810	USA, WYFR Okeechobee FL	11550as			
1700-1800	USA, WWCN Nashville TN	11550as	15695eu	21745eu		1800-1827	USA, WYFR Okeechobee FL	9840eu	15010eu		
1700-1800	USA, WYFR Okeechobee FL	3330af	4965af			1800-1900	Vietnam, Voice of	9780do			
1700-1800	Zambia, Christian Voice	4910do				1800-1900	Yemen, Yemeni Rep Radio	3330af	4965af		
1700-1800 vl	Zambia, R Zambia/ZNBC 1	6165do				1800-1900	Zambia, Christian Voice	4910do			
1700-1800 vl	Zambia, R Zambia/ZNBC 2	4828do				1800-1900 vl	Zambia, R Zambia/ZNBC 1	4910do			
1700-1800 vl	Zimbabwe, Zimbabwe BC	6150do				1800-1900 vl	Zambia, R Zambia/ZNBC 2	6165do			
1730-1800 vl	Cyprus, BRT International	6080eu				1800-1900 vl	Zimbabwe, Zimbabwe BC	4828do			
1730-1800 mtwhf	Georgia, Radio	9370as				1805-1830	Malawi, MBC	5993do			
1730-1800	Guam, AWR/KSDA	6020af	7120af	11655af		1825-1900 vl	Cyprus, BRT International	6150do			
1730-1800	Netherlands, Radio	4950as				1830-1900 t	Belarus, Radiost Belarus	6010eu	7105eu	7205eu	7210eu
1730-1740	Pakistan, Radio	11720me	11890me	15190me		1830-1900	Georgia, Radio	11910eu			
1730-1800	Philippines, R Pilipinas	9550af	11940af	15340af		1830-1900	Netherlands, Radio	6020af	7120af	9895af	11655af
1730-1756	Romania, R Romania Intl	3200af						15315af	17605af		
1730-1800 mtwhf	Swaziland, Trans World R	6065eu	13800va			1830-1900 w	Saipan, FEBC/KFBS	9465as			
1730-1800	Sweden, Radio	9590eu	13800va			1830-1900 a	Serbia, Radio Yugoslavia	6100eu	9720af		
1730-1759	Vatican State, Vatican R	11625af	15570af	17550af		1830-1900	Slovakia, R Slovakia Intl	5915eu	6055eu	7345eu	
1745-1800	Bangladesh, Bangla Betar	7190as	9570eu	15520do		1830-1835	Somalia, Radio Mogadishu	6732do			
1745-1800	India, All India Radio	7410eu	9650eu	9950af	11620af	1830-1900	Turkey, Voice of	9445eu	13695na		
		11935af	13780do	15075me		1830-1900	United Kingdom, BBC WS	6005af	9630af		
		3200af				1830-1900	USA, Voice of America	7170as	7330af	9860af	
1745-1800	Swaziland, Trans World R	9310eu				1833-1900	Cote D' Ivoire, RDTV	11920do			
1755-1800	Georgia, Voice of Hope					1840-1850	Greece, Voice of	11645af	15150af		
						1845-1900	Albania, R Tirana Intl	7270eu	9570eu		
						1845-1900 mtwhf	Armenia, Voice of	4810me	4990eu		
						1845-1900 irreg s	Mali, RDTV Malienne	4783do	4835do	5995do	

60 MONITORING TIMES August 1997

FREQUENCIES

2100-2130	Albania, R Tirana Intl	7110eu	9515eu	
2100-2200	Anguilla, Caribbean Beacon	11775am		
2100-2200	Australia, Radio	7240pa	9660pa	9850pa 11695pa
		11855as	12080pa	13605pa
2100-2130	Australia, Radio	6080pa	9860as	11880pa
2100-2130 vl	Australia, VL8A Alice Spg	2310do		
2100-2130 vl	Australia, VL8K Katherine	2485do		
2100-2200 vl	Australia, VL8K Katherine	5025do		
2100-2130 vl	Australia, VL8T Tent Crk	2325do		
2100-2200 vl	Australia, VL8T Tent Crk	4910do		
2100-2125	Belgium, R Vlaanderen Int	5910eu		
2100-2200	Bulgaria, Radio	9700eu	11720eu	
2100-2115 vl	Cameroon, Radio Cameroon	4850do		
2100-2200 vl	Cameroon, Radio Garoua	5010do		
2100-2200 vl	Canada, CBC N Quebec Svc	9625do		
2100-2200	Canada, CFCX Montreal	6005do		
2100-2200	Canada, CFRX Toronto	6070do		
2100-2200	Canada, CFVP Calgary	6030do		
2100-2200	Canada, CHNX Halifax	6130do		
2100-2200	Canada, CKZN St John's	6160do		
2100-2200	Canada, CKZU Vancouver	6160do		
2100-2130	Canada, R Canada Intl	11690af	13650af	13670af 15150af
		15325af	17820af	
2100-2130 mtwhf	Canada, R Canada Intl	5995eu	7235eu	
2100-2200	China, China Radio Intl	5220eu	6950eu	9920af
2100-2130	China, China Radio Intl	11715af	15110af	
2100-2130	China, China Radio Intl	3985eu		
2100-2200	Costa Rica, RF Peace Intl	15050am		
2100-2130	Cuba, Radio Havana	13715eu	13725eu	
2100-2200 vl	Cyprus, BRT International	6150do		
2100-2200	Ecuador, HCBJ	11990eu	21455am	
2100-2200	Egypt, Radio Cairo	15375af		
2100-2200	Eq Guinea, Radio Africa	15186af		
2100-2150	Germany, Deutsche Welle	7115au	9670as	9735af 9765as
		11785au	11865af	15135af
2100-2130	Germany, Adventist World R	9830af		
2100-2130	Hungary, Radio Budapest	3975eu	7250eu	9835eu
2100-2200	India, All India Radio	7150eu	7410eu	9910eu 9950eu
		11620au	11715au	
2100-2200 vl	Italy, IRRS	3955va		
2100-2200	Japan, R Japan/NHK World	6035as	9535na	13630as
2100-2107 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do
2100-2200	Lebanon, Voice of Hope	9960va		
2100-2115	Liberia, LCN/R Liberia Int	5100do		
2100-2107	Namibia, NBC	3270do	3290do	
2100-2200 smtwha	New Zealand, R NZ Intl	11735pa		
2100-2106 f	New Zealand, R NZ Intl	9845pa		
2100-2200	Nigeria, FRCN/Radio	3326do	4770do	4990do
2100-2200	Nigeria, Voice of	7255af		
2100-2200 vl	Papua New Guinea, NBC	4890do		
2100-2156	Romania, R Romania Intl	7105eu	7195eu	9690eu 11810eu
2100-2200	Russia, Voice of Russia WS	7250eu	7350eu	7370eu 7440eu
		9620eu	9655eu	9710eu 9765eu
		9740eu	9765eu	9775eu 9880eu
		11840eu		
2100-2200	S Africa, World Music R	3345af	6290va	
2100-2130	Serbia, Radio Yugoslavia	6100eu	6185eu	
2100-2200	South Korea, R Korea Intl	6480eu	15575eu	
2100-2130	South Korea, R Korea Intl	3970eu		
2100-2200 as	Spain, R Exterior Espana	6125eu	11775af	
2100-2105	Syria, Radio Damascus	12085na	13610eu	
2100-2110	Uganda, Radio	4976do		
2100-2200	Ukraine, R Ukraine Intl	5905eu	6010eu	6020eu 6090eu
		7180eu	7240eu	9550na 9560na
		9640na	12040na	13590na 13720na
2100-2200	United Kingdom, BBC WS	3255af	3915as	3955eu 5965as
		5975as	6005af	6180eu 6190af
		6195va	7325va	9410eu 9630va
		11750sa	11835af	11945as 12095eu
		15400af		
2100-2130	United Kingdom, BBC WS	9630af	15485af	
2100-2145	United Kingdom, BBC WS	11680sa		
2100-2200	USA, KAIJ Dallas TX	13815am		
2100-2200	USA, KTBN Salt Lk City UT	15590am		
2100-2200	USA, Monitor Radio Intl	13770eu	15280as	15665eu
2100-2200	USA, Voice of America	6035af	6040me	7375af 7415af
		9535af	9760eu	11870pa 11975af
		15185as	15410af	15445af 15580af
		17725af	17735as	
2100-2200	USA, WEWN Birmingham AL	5825am	13615na	15745eu
2100-2200	USA, WGTG McCaysville GA	9400am		
2100-2200	USA, WHRI Noblesville IN	5745am	9495am	
2100-2200	USA, WINB Red Lion PA	13790eu		
2100-2200	USA, WJCR Upton KY	7490na		
2100-2200	USA, WRMI/R Miami Intl	9955am		
2100-2200	USA, WRNO New Orleans LA	7355am		
2100-2200 smtwhf	USA, WVHA Greenbush ME	13695af		
2100-2200	USA, WWCN Nashville TN	9475am	12160am	13845am 15685am
2100-2200	USA, WYFR Okeechobee FL	7355eu	11580af	15565eu

2100-2200	Zambia, Christian Voice	3330af	4965af	
2100-2200 vl	Zambia, R Zambia/ZNBC 1	4910do		
2100-2200 vl	Zambia, R Zambia/ZNBC 2	6165do		
2100-2200 vl	Zimbabwe, Zimbabwe BC	4828do		
2108-2200 f	New Zealand, R NZ Intl	11735pa		
2115-2200	Egypt, Radio Cairo	9900eu		
2115-2130	United Kingdom, BBC WS	6175am	15390am	17715am
2120-2200	Sweden, Radio	6065eu	9430af	
2130-2200	Australia, Radio	13755pa	17795pa	17860pa
2130-2155	Austria, R Austria Intl	5945eu	6155eu	13730af
2130-2157	Czech Rep, Radio Prague	11600af		
2130-2200	Ghana, Ghana Broadc Corp	3366do		
2130-2200	Guam, AWR/KSDA	15310as		
2130-2200	Iran, VOIRI	6165au	6175au	
2130-2200	Uzbekistan, R Tashkent	9540as	9545me	
2145-2200 a	Greece, Voice of	7480au	9425au	
2200-2300	Anguilla, Caribbean Beacon	11775am		
2200-2300	Australia, Radio	11695pa	11855as	13755pa 15365pa
		17795pa	17860pa	
2200-2300 vl	Australia, VL8K Katherine	5025do		

2200 UTC

2200-2300 vl	Australia, VL8T Tent Crk	4910do		
2200-2300	Canada, CBC N Quebec Svc	9625do		
2200-2300	Canada, CFCX Montreal	6005do		
2200-2300	Canada, CFRX Toronto	6070do		
2200-2300	Canada, CFVP Calgary	6030do		
2200-2300	Canada, CHNX Halifax	6130do		
2200-2300	Canada, CKZN St John's	6160do		
2200-2300	Canada, CKZU Vancouver	6160do		
2200-2230	Canada, R Canada Intl	5960eu	9755am	11705as 13670am
		13740am	15305am	
2200-2300	China, China Radio Intl	9880eu		
2200-2300	Costa Rica, RF Peace Intl	7385am	15050am	
2200-2210	Croatia, Croatian Radio	5895eu	7370eu	
2200-2245	Egypt, Radio Cairo	9900eu		
2200-2300	Eq Guinea, Radio Africa	15186af		
2200-2215	Ghana, Ghana Broadc Corp	4915do		
2200-2230	India, All India Radio	7150eu	7410eu	9910eu 9950eu
		11620au	11715au	
2200-2230	Iran, VOIRI	6165au	6175au	
2200-2225	Italy, RAI Intl	6150as	9565as	11815pa
2200-2300	Lebanon, Voice of Hope	9960va		
2200-2215	Liberia, LCN/R Liberia Int	5100do		
2200-2300	Malaysia, Radio	7295do		
2200-2225	Moldova, R Moldova Intl	7520eu		
2200-2300 fa	New Zealand, R NZ Intl	11735pa		
2200-2215	Nigeria, FRCN/Radio	3326do	4770do	4990do
2200-2230 s	Norway, Radio Norway Intl	9965sa		
2200-2300 vl	Papua New Guinea, NBC	9675do		
2200-2300	Russia, Voice of Russia WS	7125na	7250na	9620na 9655na
		9665na		
2200-2215	Sierra Leone, SLBS	3316do		
2200-2300	Slovakia, Adv World Radio	6055af		
2200-2300	Taiwan, VO Free China	15600eu	17750eu	
2200-2300	Turkey, Voice of	6135eu	7280eu	9560na 9655na
2200-2300	United Kingdom, BBC WS	5965as	5975am	6175am 6180eu
		6195as	7325va	9410va 9590am
		9660as	9890as	9915am 11750am
		11835af	11955as	12080as 15400af
2200-2230	United Kingdom, BBC WS	12095eu		
2200-2300	USA, KAIJ Dallas TX	13815am		
2200-2300	USA, KTBN Salt Lk City UT	15590am		
2200-2300	USA, Monitor Radio Intl	13770eu	15280as	
2200-2300	USA, Voice of America	7215as	9705as	9770as 11760as
		15185as	15290as	15305as 17735as
		17820as		
2200-2230 mtwhf	USA, Voice of America	6035af	7340af	7375af 7415af
		11975af		
2200-2300	USA, WEWN Birmingham AL	5825na	9975eu	13615na
2200-2300	USA, WGTG McCaysville GA	5085am		
2200-2300	USA, WHRI Noblesville IN	5745am	9495am	
2200-2300	USA, WINB Red Lion PA	13790am		
2200-2300	USA, WJCR Upton KY	7490na		
2200-2300	USA, WRMI/R Miami Intl	9955am		
2200-2300	USA, WRNO New Orleans LA	7355am		
2200-2300 s	USA, WVHA Greenbush ME	5850eu		
2200-2300	USA, WWCN Nashville TN	7435am	9475am	12160am 13845am
2200-2300	USA, WYFR Okeechobee FL	17845af	21525af	
2200-2300 vl	Zambia, R Zambia/ZNBC 1	4910do		
2230-2300	Canada, R Canada Intl	5960am	9755am	13670am
2230-2300	Cuba, Radio Havana	6000na		
2230-2227	Czech Rep, Radio Prague	7345na	11600na	
2230-2255	Moldova, R Moldova Intl	7520eu		
2240-2250	Greece, Voice of	7480au	9425au	
2245-2300	Ghana, Ghana Broadc Corp	3366do	4915do	
2245-2300	India, All India Radio	9705as	9950as	11620as
2245-2300	Vatican State, Vatican R	7305as	9600as	11830au

FREQUENCIES

2300-0000	Anguilla, Caribbean Beacon	6090am				2300-2356	Romania, R Romania Intl	5990na	6155na	9510na	9570na
2300-0000	Australia, Radio	9660pa	11695as	12080pa	13755as			11940na			
		15365pa	17795pa	17860pa		2300-0000	Russia, Voice of Russia WS	7125na	7250na	9665na	
2300-0000 vl	Australia, VL8K Katherine	5025do				2300-0000	Turkey, Voice of	6135na	7280eu	9655na	
2300-0000 vl	Australia, VL8T Tent Crk	4910do				2300-0000	United Kingdom, BBC WS	3915as	5965as	5975am	6175am
2300-0000	Bulgaria, Radio	7480na	9435na					9580as	9590na	9915am	11750sa
2300-0000	Canada, CBC N Quebec Svc	9625do						11945as	11955as	15380as	
2300-0000	Canada, CFCX Montreal	6005do				2300-2315	United Kingdom, BBC WS	15400af			
2300-0000	Canada, CFRX Toronto	6070do				2300-0000	USA, KALJ Dallas TX	13815am			
2300-0000	Canada, CFPV Calgary	6030do				2300-0000	USA, KTNB Salt Lk City UT	15590am			
2300-0000	Canada, CHNX Halifax	6130do				2300-0000	USA, KWHR Naalehu HI	17510as			
2300-0000	Canada, CKZN St John's	6160do				2300-0000	USA, Monitor Radio Intl	13770af	15280sa		
2300-0000	Canada, CKZU Vancouver	6160do				2300-0000	USA, Voice of America	7215as	9705as	9770as	11760as
2300-0000 mtwhf	Canada, R Canada Intl	9755am	11940am	13670am	15305am			15185as	15290as	15305as	17735as
2300-0000 as	Canada, R Canada Intl	5960am	9755am	11940am	13670am			17820as			
		15305am				2300-0000	USA, WEWN Birmingham AL	5825na	9975na	13615na	
2300-0000	Costa Rica, Adv World R	5030am	6150am	9725am	13750am	2300-0000	USA, WGTG McCaysville GA	9400am			
		15460am				2300-0000	USA, WHRI Noblesville IN	5745am	9495am		
2300-0000	Costa Rica, RF Peace Intl	7385am	15050am			2300-0000	USA, WINB Red Lion PA	13790am			
2300-2310	Croatia, Croatian Radio	5895eu	7370eu			2300-0000	USA, WJCR Upton KY	7490na			
2300-2330	Cuba, Radio Havana	6000na				2300-0000	USA, WRMI/R Miami Intl	9955am			
2300-0000	Egypt, Radio Cairo	9900na				2300-0000	USA, WRNO New Orleans LA	7355am			
2300-2350	Germany, Deutsche Welle	5980as	7235as	9690as		2300-0000 mtwhf	USA, WVHA Greenbush ME	9900af			
2300-0000	Guam, AWR/KSDA	11775as				2300-0000	USA, WWCR Nashville TN	5070am	7435am	9475am	13845am
2300-0000	Guatemala, Adv World R	11775am				2307-0000	New Zealand, R NZ Intl	15115pa			
2300-0000	India, All India Radio	9705as	9950as	11620as		2310-2315	Kyrgyzstan, Kyrgyz Radio	4010do	4050do		
2300-0000	Lebanon, Voice of Hope	9960va				2330-0000	Australia, Radio	13605as	17880as		
2300-2315	Liberia, LCN/R Liberia Int	5100do				2330-2355	Belgium, R Vlaanderen Int	9925sa	11690am		
2300-0000	Malaysia, Radio	7295do				2330-0000 vl	Ghana, Ghana Broadc Corp	4915af			
2300-2306	New Zealand, R NZ Intl	11735pa				2330-0000	Iraq, Radio Iraq Intl	6050eu	11890eu		
2300-2315	Nigeria, FRNC/Radio	3326do	4770do	4990do		2330-0000	Netherlands, Radio	6020na	6165na	9845na	
2300-2325	North Korea, R Pyongyang	11700na	13650na			2335-2345	Greece, Voice of	9395sa	9425sa	9935sa	11595sa
2300-0000 vl	Papua New Guinea, NBC	9675do				2335-2345	Sierra Leone, SLBS	3316do			

SELECTED PROGRAMS

Sundays

2300	Costa Rica, AWR: DXing with Cumbre.
2300	Costa Rica, R for Peace Intl: World of Radio.
2300	Guam, AWR/KSDA: Wavescan.
2305	Egypt, Radio Cairo: The Holy Koran and Its Meaning.
2315	USA, WWCR #3 Nashville TN: Ask WWCR.
2330	Egypt, Radio Cairo: Egyptian Songs.
2330	USA, WWCR #3 Nashville TN: World of Radio.
2331	Australia, Radio: The Sports Factor.
2331	Belgium, R Vlaanderen Intl: News.
2332	Russia, Voice of: Folk Box.
2339	Netherlands, Radio (am): Wide Angle.
2354	Netherlands, Radio (am): Siren Song.

Mondays

2300	Canada, N Quebec Svc: As It Happens.
2300	Canada, RCI Montreal: The World at Six.
2300	Vatican State, Vatican Radio: Ask the Abbot.
2310	USA, VOA Washington DC (as pac): VOA Worldwide.
2311	Russia, Voice of: News and Views.
2315	Egypt, Radio Cairo: News.
2345	USA, KWHR Naalehu HI: Reach Out.
2352	Costa Rica, R for Peace Intl: Hightower Radio.
2353	Netherlands, Radio (am): A Good Life.

Tuesdays

2300	Canada, N Quebec Svc: As It Happens.
2300	Canada, RCI Montreal: The World at Six.
2300	USA, VOA Washington DC (as pac): VOA News.
2305	Egypt, Radio Cairo: E-Mail.
2310	USA, VOA Washington DC (as pac): VOA Worldwide.
2311	Russia, Voice of: News and Views.
2315	Egypt, Radio Cairo: News.
2330	Costa Rica, R for Peace Intl: UN Perspective.
2332	Russia, Voice of: Your Top Tune.
2335	Greece, Voice of: News.
2338	Netherlands, Radio (am): Newline.
2347	Russia, Voice of: You Write to Moscow.

Wednesdays

2300	Canada, N Quebec Svc: As It Happens.
2300	Canada, RCI Montreal: The World at Six.
2300	Cuba, Radio Havana Cuba: National News.
2300	Vatican State, Vatican Radio: Would You Believe It?
2306	Cuba, Radio Havana Cuba: Timeout.

2310	USA, VOA Washington DC (as pac): VOA Worldwide.
2311	Cuba, Radio Havana Cuba: Youth Speak Out.
2311	Russia, Voice of: News and Views.
2315	Egypt, Radio Cairo: News.
2335	Greece, Voice of: News.

Thursdays

2300	Canada, N Quebec Svc: As It Happens.
2300	Canada, RCI Montreal: The World at Six.
2300	Vatican State, Vatican Radio: Ask the Abbot.
2310	USA, VOA Washington DC (as pac): VOA Worldwide.
2311	Russia, Voice of: News and Views.
2315	Egypt, Radio Cairo: News.
2330	Costa Rica, R for Peace Intl: UN Scope.
2330	Egypt, Radio Cairo: Arabic Music.
2335	Greece, Voice of: News.
2338	Netherlands, Radio (am): Newline.
2352	Costa Rica, R for Peace Intl: Hightower Radio.

Fridays

2300	Canada, N Quebec Svc: As It Happens.
2300	Canada, RCI Montreal: The World at Six.
2300	USA, VOA Washington DC (as pac): VOA News.
2305	Egypt, Radio Cairo: The Holy Koran and Its Meaning.
2310	USA, VOA Washington DC (as pac): VOA Worldwide.
2311	Russia, Voice of: News and Views.
2315	Bulgaria, Radio: Events and Development.
2315	Egypt, Radio Cairo: News.
2330	Bulgaria, Radio: Straight from the Horse's Mouth.
2330	Egypt, Radio Cairo: Arabic Music.
2335	Greece, Voice of: News.
2338	Netherlands, Radio (am): Newline.
2346	Bulgaria, Radio: Radio Bulgaria Calling.
2352	Costa Rica, R for Peace Intl: Earth and Sky.
2353	Netherlands, Radio (am): Documentary.

Saturdays

2300	Guam, AWR/KSDA: Wavescan.
2300	Vatican State, Vatican Radio: On-the-Air.
2311	Russia, Voice of: News and Views.
2315	Egypt, Radio Cairo: News.
2315	Guam, AWR/KSDA: Pacific Island Journal.
2328	Egypt, Radio Cairo: Press Review.
2332	Russia, Voice of: This is Russia.
2353	Egypt, Radio Cairo: The Civilization of Islam.

RADIO PROGRAMS,
continued from Page 43

0940	KTWR (Guam): "Pacific DX Report"
1030	Voice of America (as pac): "Communications World"
1100	Radio For Peace Intl: "World of Radio"
1130	WWCR #3 (Tennessee): "World of Radio"
1130	Voice of America (as pac): "Communications World"
1245	Voice of Turkey: "DX Corner (biweekly)"
1300	WHRI (Angel 2): "DXing with Cumbre"
1300	WWCR #1 (Tennessee): "World of Radio"
1342	Radio Tashkent: "Radio Tashkent DX Program"
1349	Radio Romania Intl: "DX Mailbag"
1430	WHRI (Angel 2): "DXing with Cumbre"
1455	FEBC (Philippines): "DX Dial"
1519	Radio Romania Intl: "DX Mailbag"
1730	Voice of America (af/me/south as): "Communications World"
1730	WHRI (Angel 1): "DXing with Cumbre"
1800	Radio For Peace Intl: "World of Radio"
1909	HCBJ (eu): "DX Partyline"
1915	Voice of Turkey: "DX Corner (biweekly)"
1949	Radio Romania Intl: "DX Mailbag"
1958	Vatican Radio: "On-the-Air"
2015	WRMI (Florida): "Wavescan"
2104	Radio Havana Cuba: "DXers Unlimited"
2130	Voice of America (me): "Communications World"
2131	Radio Exterior de Espana: "Distance Unknown"
2149	Radio Romania Intl: "DX Mailbag"
2215	Voice of Turkey: "DX Corner (biweekly)"
2230	WHRI (Angel 1): "DXing with Cumbre"
2230	WRMI (Florida): "Wavescan"
2300	Vatican Radio: "On-the-Air"
2300	KSDA (Guam): "Wavescan"

LOCAL BROADCASTING WITH NVIS

By Jacques d'Avignon
monitor@rac.ca

OPTIMUM WORKING FREQUENCIES (MHz)

For the Period 15 August to 14 September 1997 Flux=83 SSN=21

In the tropical areas of the world, dense vegetation causes such extreme attenuation of ground waves that this normal broadcasting mode is basically impossible to use under jungle conditions.

The lateral attenuation of the ground wave has been demonstrated by Hagn and Barker (Ref 1) to be an increasing function of frequency:

$$\alpha_L(\text{dB/m}) = 0.009 f(\text{MHz}) + 0.1 \quad (1)$$

If we use equation (1) we find that at 3.0 MHz the lateral attenuation due to vegetation would be 127 dB/km; at 10 MHz, along the same path, the attenuation is now up to 190 dB/km! In the same reference, Hagn and Barker cite the losses using NVIS as being only 97 dB for 600 km or 0.16 dB/km along the ionospheric virtual path, when using NVIS at 3.0 MHz. This is a substantial difference! It is obvious why ground wave cannot be used for broadcasting in a jungle or tropical environment.

On the other hand, if the normal HF ionospheric mode was used for local broadcasting, the "local" audience, widely scattered in small pockets around the transmitter site, would be located inside the skip zone of the HF transmitter and, looking at Equation (1) above, it is obvious that it would not be commercially viable to increase the power sufficiently to use ground wave mode. Increasing the power would not insure that you would reach your audience but, because of the absorption, it would definitely warm up the vegetation surrounding the transmitter site! So for tropical broadcasting, we are left with one option: the Near Vertical Incidence Skywave mode of HF propagation we discussed last month.

Some stations in the interior of Australia (Alice Spring is one example), have been broadcasting using this technique to reach their widely scattered audiences. These Australian stations are using this "District" propagation, as they call it, in the "tropical domestic" band that extends from 2.300 to 2.495 MHz. The transmissions, designed to be local in nature, are fulfilling their role very well, but they can also be heard in Eastern North America in the early morning hours at certain times of the year.

The NVIS broadcasting technique is also prevalent in Africa and South America for daily domestic broadcasting use. If you live on the East Coast of North America, check the frequencies in the "tropical bands" on your shortwave receiver in late afternoon and you will hear stations from those regions.

The specific tropical bands are: 2.300 - 2.495 MHz, 3.200 - 3.400 MHz, and 4.750 - 5.060 MHz. In addition, there are the "domestic bands" between 3.900 - 3.950 MHz in Asia and

UTC	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
TO/FROM US WEST COAST																								
SOUTH AMERICA	20	17	17	14	12	11	11	11	11	10	8	9	10	13	16	18	18	18	19	19	20	20	21	21
WESTERN EUROPE	10	9	8	8	8	8	8	8	8	0	0	0	0	0	12	14	15	15	14	15	14	14	13	11
EASTERN EUROPE (P)	0	0	9	10	12	11	10	0	0	0	0	0	0	0	12	14	15	15	14	13	12	0	0	0
MEDITERRANEAN	12	11	11	11	11	11	10	0	0	0	0	0	0	0	14	16	17	17	17	17	16	15	13	12
MIDDLE EAST (P)	0	11	13	14	13	0	0	0	0	0	0	0	0	0	12	14	15	16	14	0	0	0	0	0
CENTRAL AFRICA	15	14	12	10	9	9	10	0	0	0	0	0	0	0	15	16	17	18	19	19	19	18	17	16
AFRICA	11	11	10	10	9	9	11	11	0	0	0	0	0	0	16	17	18	19	19	16	14	0	0	12
SOUTH EAST ASIA (P)	17	17	17	16	15	0	0	0	0	0	0	9	9	9	10	12	14	14	14	14	0	0	0	16
FAR EAST	16	16	16	15	14	13	11	10	9	9	9	9	9	9	10	10	10	10	10	10	13	16	17	17
AUSTRALIA	22	21	20	20	17	15	13	12	12	11	11	11	11	10	10	12	12	0	0	0	0	19	20	21
TO/FROM US MIDWEST																								
SOUTH AMERICA	17	16	14	12	11	10	10	10	10	9	8	9	11	14	16	16	17	18	18	18	19	19	20	20
WESTERN EUROPE	11	10	10	9	9	9	9	9	9	0	0	0	12	15	16	16	17	16	16	16	16	16	15	13
EASTERN EUROPE	8	8	8	9	11	9	0	0	0	0	0	0	0	13	14	15	15	15	14	14	13	0	0	0
MEDITERRANEAN	12	11	11	11	11	10	9	0	0	0	0	0	0	15	16	17	17	17	17	17	16	14	13	12
MIDDLE EAST (P)	11	11	12	13	11	0	0	0	0	0	0	0	0	13	14	16	17	16	15	14	0	0	0	11
CENTRAL AFRICA	15	14	12	10	9	9	10	0	0	0	0	0	0	16	17	18	19	19	19	19	18	18	17	16
SOUTH AFRICA	12	11	10	10	9	10	10	0	0	0	0	0	0	16	18	18	19	19	19	16	14	13	13	12
SOUTH EAST ASIA (P)	16	16	15	14	0	0	0	0	0	0	0	9	9	10	12	14	14	13	13	0	0	0	0	15
FAR EAST	16	16	15	14	13	12	10	9	9	9	9	9	9	10	11	11	11	11	0	0	13	15	16	16
AUSTRALIA	21	20	19	16	14	12	11	11	11	11	11	11	10	11	13	12	12	0	0	0	14	19	20	21
TO/FROM US EAST COAST																								
SOUTH AMERICA	14	12	10	10	9	9	9	9	9	7	7	10	14	15	15	16	16	16	17	17	18	18	18	16
WESTERN EUROPE	10	9	9	8	8	8	8	8	8	0	9	13	14	15	16	16	16	15	15	15	15	15	14	12
EASTERN EUROPE	9	8	8	9	9	8	0	0	0	0	0	12	14	15	15	15	15	15	15	13	11	10	9	
MEDITERRANEAN	11	11	10	10	10	9	9	0	0	0	0	14	15	16	16	17	17	17	17	17	15	12	12	11
MIDDLE EAST (P)	11	11	11	10	0	0	0	0	0	0	0	14	16	16	17	17	17	17	16	14	13	12	12	11
CENTRAL AFRICA	15	14	12	11	9	9	11	10	0	0	0	15	18	19	19	19	19	19	19	19	19	20	18	16
SOUTH AFRICA	12	11	10	10	9	10	11	10	0	0	0	16	18	18	18	19	19	19	19	16	14	13	13	13
SOUTH EAST ASIA (P)	15	14	13	0	0	0	0	0	0	0	0	11	13	15	16	14	14	13	0	0	0	0	11	13
FAR EAST	16	15	14	13	0	0	0	0	9	9	9	10	12	12	11	0	0	0	0	0	13	16	16	17
AUSTRALIA	19	17	15	0	0	0	11	10	10	10	10	10	12	12	12	0	0	0	0	0	14	19	19	19

3.950 - 4.000 MHz in Europe. Yes, that is the top of the 75 meter band used by radio amateurs! In Europe it is also a popular broadcast band used by many international broadcasters. So NVIS does work: it is being used commercially for local broadcasting, but there is no guarantee your "local" signal will not be heard half way around the world!

INTERESTING WEB PAGE

For those with access to the Internet, try http://www.ips.gov.au/asfc/usa_hf/ This page is produced by IPS in Australia and is automatically updated hourly. One map shows F2 critical frequencies across the USA, based on data received in real-time (hourly updates) from the USA. These frequencies could be used as proxies

for district/NVIS frequencies.

The HAP (Hourly Area Predictions) maps also found on this page give you the best frequency to communicate with a station for which the specific HAP map was drawn.

Let us know what you would like to see discussed in this page; send your ideas to the Editor or to myself. Have a good summer and don't worry, that static you are hearing will disappear shortly; autumn is around the corner!

(Ref 1). Hagn, G. H. and G.E. Barker, 1970, "Research-Engineering and Support for Tropical Communications," AD-889-169, Final Report, Contract DA-36-039 AMC-00040(E), SRI Project 4240, Stanford Research Institute, Menlo Park, CA.

Are You Suffering from LMS?

If you have been following my writings here and other places, you know I've identified myself as a "DC to Daylight" monitor. If it's out there in the radio frequency spectrum I want to hear it, log it, and enjoy it. Further, as a dedicated amateur radio operator I also have a strong desire to transmit signals everywhere that the FCC allows. (Some folks do not feel burdened by the law and choose to both listen and transmit in other places, but that is clearly another story altogether.)

Anyway, is it any wonder that I sometimes feel a little sad when I see someone, especially a beginner, limiting his or her listening opportunities? Many beginners (and actually quite a few old timers, too) suffer from that all too common radio monitoring disease, LMS.

LMS stands for **Limited Mode Syndrome**. You see it all the time. Somebody purchases a nice new general coverage receiver, but they never switch it out of the AM mode to hear everything else there is to enjoy. Likewise, somebody might work hard, study ceaselessly, and eat all their vegetables in order to acquire an amateur radio license, only to limit their entire ham experience to a few chats on the local 2 meter FM repeater. A scannist might pay extra for a full featured scanning receiver only to program in the local FM public safety stuff and never make use of the AM aircraft bands.

You get the picture, pal? Even modest priced gear can be undervalued when it is not fully utilized. The whole radio spectrum awaits your curiosity, tenacity, and even your participation. So let's take a few minutes to discover some of those modes that are off the beaten track for an average listening session.

■ CW

Okay, let's begin at the beginning. Continuous Wave transmission has been around since the beginning of radio. It has fallen out of favor to some more sophisticated digital modes of communication in many circles, but it still remains on the air in many places. While no longer monitored as a distress signal by the U.S. Coast Guard, CW communications can still be found in the maritime world. Additional Morse signals can be found throughout the utility bands if you dig around.

For amateur radio operators, code proficiency remains at this time the key access to many portions of the HF amateur spectrum.

First, it is required for the higher class licenses that allow the ham access to those frequencies. Secondly, many rare DX stations operate almost exclusively in the CW mode. Finally, the majority of the amateur radio community recognizes CW as a skill, and a growing portion of this same community loves it as an art. Further, you can get by with modest equipment. Folks who are excited about low power operating (QRP) find CW gets the signal through.

Another group of hams who make use of CW are the VHF/UHF "weak signal" crowd. These are folks who try to push the limits of the distances that can be achieved above 30 MHz. (Ironically, this 30 MHz-and-up world is primarily populated with "No Code" technician class operators.) These radio experimenters will even make use of exotic propagation, such as working stations by way of the ionized trails left by meteors and by using the surface of the moon as a passive reflector. So, just because you didn't need to test for the code when you went for your ham license doesn't mean you might not want to get in on the fun of weak signal communication now.

If you aspire to the ultimate in the CW experience, check out the folks working each other in the Extra Class portions of the CW bands. Casual chats in excess of 30 words a minute might make your head spin as a beginner, but it's something to shoot for. If the high speed stuff makes you dizzy, come on down where I hang out. If you ever want to find Uncle Skip on the air, check out the Novice portion of the 40 meter Ham Band (7100-7150 kHz). I love the enthusiasm that I find in the novice bands. It's contagious. It's also a sure cure for LMS.

You scannists out there don't get off the hook, either. Most repeater based operations found in the VHF/UHF bands identify by way of a Morse code signal. Often, copying this automatic ID transmission is the key to figuring out who you might be monitoring. So a bit of code study will help you out, too. Many of the advertisers in the pages of *MT* have code tapes and programs available to help get you on track. You can also monitor regular code practice sessions daily from WIAW on 1818, 3581.5, 7047.5, 14047.5, 18097.5, 21067.5,



An all mode transceiver such as this ICOM IC-821H can get an amateur on all of the modes available to a Technician Class ham.

28067.5 kHz. And don't forget, once you get the code down, you should head to the local Volunteer Examiner testing site and get that ham license with HF privileges.

■ SSB

Single sideband transmissions, both upper and lower, can open up a whole new world to any monitor suffering from LMS. First of all, USB and LSB are the keys to monitoring much of what is worth listening to in the utility portions of the shortwave spectrum. Although a majority of point-to-point communications may be found primarily in the USB mode, don't forget the LSB position. Remember that amateur radio operators can be traditionally found using LSB on 40, 80, and 160 meters. SSB is also used in the VHF/UHF portions of the amateur radio spectrum. Once again, the weak signal crowd is fond of this mode for its long distance capabilities. It is also used for EME (earth-moon-earth, or moonbounce) communications.

Single sideband is a common communication mode on the amateur radio satellites. Some of the more intriguing amateur radio gear from a purely technical standpoint are the dual band, multimode VHF/UHF rigs. With AMSAT Phase III ready to launch, you may want to take a look at what's available. *Satellite Times* will help you keep up with the latest developments.

■ AM and FM Vice Versa

Okay, you're a dedicated shortwave broadcast listener who is trying to figure out why there is an FM position on your general coverage receiver. The place to look for communications in this mode would be the 10 meter

ham band. Between 29.5 and 29.7 MHz you will find FM repeater activity in most states.

And, you scannists who are trying to figure out why you need AM capability, need look no further than the aircraft frequencies between 116 and 136 MHz. AM is the mandated mode for air travel because it doesn't suffer from "capture effect"—the tendency of a stronger signal to override a weaker one, common in FM mode. By using AM, a weaker signal can still get through under a stronger one. The importance of this in an emergency situation should be self-evident.

■ The Digital Modes

Now that hobbyists have figured out how to hook up their home computers to their receivers, the opportunity to translate the various digital modes of transmission has become possible. Many interfaces are currently available, as are any number of dedicated demodulators. Adding these devices to your listening post can open up a whole new world, no matter if you listen to HF or VHF/UHF signals.

■ RTTY

Traditional five level Baudot code has been around for a long time. Only now are more modern signal systems overtaking its use.

One of the things that most often confuses beginners is when your system starts decoding a signal successfully but the screen shows gibberish. Remember, there are a lot of RTTY stations out there using languages with alphabets that don't translate into English. Cyrillic, Arabic, and Chinese come immediately to mind. It's a bigger world than you knew, now that you are a radio hobbyist. Keep an eye on the Utility World and Digital Digest columns, and you'll soon get an idea of what is out there worth monitoring.

■ ASCII

The American Standard Code for Information Interchange is the language that computers use to talk to each other. It is a seven level code that resolves many of the text transmission problems of Baudot. Right now it is mostly used experimentally by Amateur Radio operators in the portions of the ham bands set aside for RTTY.

■ SITOR

Simplex Telex Over Radio is a very common, improved coding system in common use today. It is a system that allows for correction of errors in its transmissions by way of intercommunication of the sending and receiving

station. There are two forms of SITOR communication:

SITOR "A" works by sending its signal three characters at a time and then waiting for an acknowledgment signal sent back by the receiving station on a different frequency. Once the sending station is sure that "the mail got through," it proceeds to send its next three character group.

SITOR "B" performs its error correction "on the fly." This is known as Forward Error Correction (FEC). The data is sent in a continuous stream. However, each character is sent twice along with a series of control characters. The receiving station's system performs a series of error tests to assure that the data is accurate. SITOR "B" lends itself best to transmitting news and weather broadcasts.

Amateur radio operators also use their own variations of the SITOR systems of transmission called AMTOR.

■ ARQs and FECs

There are quite a few more exotic RTTY signals out there worth giving a listen to if your equipment is up to it. ARQ stands for AUTOMATIC REQUEST. This is a form of message error correction that involves the receiving station sending signals back to the transmitting station to assure the message was properly received. (SITOR-A would be considered an ARQ mode)

ARQ-M is a system that allows either two or four different data signals to travel along a single carrier. ARQ-E is a single channel system used by the French Military, as is ARQ-E3. Other ARQ systems you will encounter include SWED-ARQ, used by the Swedish Embassies, and DUP-ARQ, used by the Hungarian Embassies. Many other diplomatic services make use of systems known as FEC-A and FEC-3.

Baud rates and frequency shifts are all over the map in these modes. You will need to keep an eye on RTTY loggings in *MT* to get a real handle on the latest trends.

■ ACARS

This is the Aircraft Communications Addressing and Reporting System, a VHF teletype mode that is used to transmit data, telemetry, and messages between commercial aircraft and airports. Most of this communication currently goes on at 131.55 MHz. With a computer or demodulator set up to monitor these communications, you can get some great insights into modern aircraft operations. If you are interested in aero monitoring and haven't set yourself up for ACARS communications yet, you are missing half the fun.

■ Packet Radio

This mode of communication was supposed to take over the whole of amateur radio communication when it first arrived on the ham scene over a decade ago. It didn't exactly do that (I'm still playing with CW, remember?). It did, however, carve out its own niche in the ham hobby, both on the HF and VHF/UHF amateur frequencies.

Many hams use this digital mode for routine communication. But the mode has really taken on its best use among the hams dedicated to public safety activities. Packet radio is used for emergency traffic handling as well as supporting such programs as Skywarn. Experiments are also going on with hams linking packet equipment to GPS receivers to create tracking devices by way of the APRS (amateur packet radio) system. This mode still has a lot of new excitement still coming around the bend.

You get the idea, my friend? This whole exercise was just meant to show you a bit about what is out there. We didn't even have space to check out television (both slow and fast scan), amplitude compandered single sideband, spread spectrum—I could go on and no doubt will in some future column. Meanwhile, have fun! Try a new mode this month. It's a sure cure for LMS.

The BECKER 2340

The only in-dash car stereo system with shortwave, AM/FM, and cassette.

~~\$589.00~~
NOW ONLY
\$559.00
LIMITED TIME OFFER
Free Shipping



With shortwave 19/22/25/31/41/49 M plus a remote control, this top-of-the-line in-dash stereo system offers ease of use for even the most complex functions and is adaptable to most vehicles.

Available exclusively from:

EAI Erie Aviation International, INC.
1607 Asbury Road • P.O. BOX 8283 • Erie, PA 16505
Fax 814.833.3672 • shancock@velocity.net
1.800.395.8934

Lowfer ZWI

Much has been written (here and elsewhere) about the 160–190 kHz “Lowfer” (low frequency experimenters) band. Few, however, have actually *seen* a lower station—or the operator behind the controls. This month, we’ll take a field trip to Lowfer station ZWI (178.6 kHz) run by Howard “Mort” Mortimer (WB2ZWI) of Baldwinsville, New York.

A little background is in order. During the spring of ‘91, I was in diligent search of loggings for use in my first *Below 500 kHz* column. Having taken a break from the hobby for several years, my direct contacts for this information were rather limited. By coincidence (or maybe not) Mort was also seeking LF information—for his newly acquired Palomar Engineers LF transmitter.

He’d spotted my name in an old issue of the *Lowdown*, and since I lived nearby, he sent me a letter with his questions. Mort’s timing couldn’t have been better. I was able to give him the information he needed, and he was able to supply me with numerous loggings for my first column. We’ve maintained a special friendship ever since that first meeting. Now, let’s get started on the field trip.

Arrival, 1945

My visit to ZWI began with a stop for breakfast at the B’ville Diner, a 50’s-era restaurant with a well-deserved reputation for good food. There, I met Mort and fellow longwave enthusiast Gordon Hullin, K2ZBU. The three of us chatted for a long time about radio (what else!) and what I could expect to see during my visit to Baldwinsville. With breakfast finished, it was now time to head for station ZWI.

For kicks, I switched on my Sangean portable as we approached Mort’s house. There was no mistaking it—a *pounding* signal on 179 kHz repeatedly sent the call sign of the beacon. I knew I was in the right place.

ZWI—A Look Inside

The transmitter for ZWI sits on a shelf in the corner of Mort’s basement and normally runs 24 hours a day. An ammeter connected to the transmitter jumps in perfect step with the Morse ID being transmitted.

The antenna for ZWI is a single sloping wire that is secured to a tree beside Mort’s house. It was once much higher, but a storm wiped out the original installation and the antenna had to be moved to this lower elevation—at least for the time being.

Despite its simplicity, ZWI has been heard by several listeners across upstate New York, and even one in Minnesota. The Minnesota reception could be verified because the listener reported the exact ID format of the beacon, which had not been published anywhere.

As far as I know, ZWI is the first lowfer to receive coverage in a daily newspaper. A few years ago, his station was featured in the *Ham Radio* column of the *Herald-American* newspaper of Syracuse, New York. In this, and many other ways, Mort deserves credit for promoting low frequency radio. At hamfests, he even sports a sign that announces his beacon’s frequency, and he is always happy to tell a newcomer about low frequency radio.

Just seeing ZWI would have been a worthwhile trip, but I was also treated to a visit to Gordon’s station. An entire story could be written about this visit, as well. In short, it was like taking a step back into history.

Gordon’s equipment consists of meticulously restored equipment, from WWII right through the 1960’s. Old timers will recognize some of these classic model numbers seen during my visit: RBL-5, SP-600, Mackay 128AY, R-388 and BC-348. Gordon points out that all of this gear is as clean on the inside as it is on the outside.



FIGURE 1. Mort points to the transmitter used at his Lowfer station in near Syracuse, NY (ZWI/178.6 kHz). His station has been heard as far away as Minnesota.

It was a day to remember. Mort and Gordon certainly are doing their share to promote VLF radio in the Syracuse area.

Summer Loggings

Let’s be honest. August is not known for its stellar LF conditions. However, if the static is not too heavy, some surprising DX can be still be found. Try listening in the early mornings, before static levels build up. This is also a perfect time to pack your portable gear and go on a DXpedition. To get you started, Table 1 lists some of the most commonly logged beacons in North America. As always, feel free to send your loggings, questions, or comments to me at P.O. Box 98, Brasstown, NC 28902.

New VLF Tape

In response to many questions about what can be heard below 500 kHz, I’ve just completed an inexpensive cassette titled *VLF RADIO!—The Sounds of Longwave*. The tape plays actual recordings of beacons, European broadcasters, Lowfers, GWEN, WWVB, Omega, Natural Radio, and more. A narration explains each sound and offers tips for improved reception. Tapes are available for \$11.95 (postpaid) from: Kevin Carey, P.O. Box 56, West Bloomfield, NY 14585.

VLF RADIO!

60 Min. Cassette featuring
“The Sounds of Longwave”



Hear WWVB, Omega, Whistlers, Beacons, European Broadcasters and many other fascinating signals from radio’s “down under.” Includes many tips for improved reception. A superb introduction for the newcomer and a handy reference for the seasoned listener.

\$11.95 Postpaid (U.S. funds) from:

Kevin Carey
P.O. Box 56, West Bloomfield, NY 14585

SELECTED BEACON LOGGINGS

FREQ.	ID	LOCATION
194	TUK	Nantucket, MA
198	DIW	Dixon, NC
206	GLS	Galveston, TX
216	CLB	Wilmington, NC
236	GNI	Grand Isle, LA
245	YZE	Gore Bay, ONT
246	DFI	Defiance, OH
248	UL	Montreal, QUE
257	SQT	Melbourne, FL
263	YGK	Kingston, ONT
305	RO	Roswell, NM
329	CH	Charleston, SC
332	HK	Hickory Hills, IL
344	CL	Cleveland, OH
344	FCH	Fresno, CA
346	YXL	Sioux Lookout, ONT
356	YZD	Downsview, ONT
362	SB	Sudbury, ONT
363	RNB	Millville, NJ
366	YMW	Maniwaki, QUE
379	BRA	Asheville, NC
379	GKQ	Newark, NJ
382	LQ	Boston, MA
388	NXX	Willow Grove, PA
413	YHD	Dryden, ONT
417	IY	Charles City, IA
428	COG	Orange, VA
429	IKY	Springfield, KY
432	IZN	Lincolnton, NC
512	HMY	Lexington, OK

Now hear 90% more

official radio reports of abandoned vehicle, accident, affray, aircraft crash, aircraft hijack, airport emergency, ambulance request, animal nuisance, armed robbery, arrest, arson, assault, assist citizen, barking dog, be on the lookout for..., bomb threat, blockade, blocked driveway, boating accident, burglary in progress, carjacking, check for wants & warrants, civil disturbance-racial, civil disturbance-teenagers, code blue, code red, dangerous animal, deceased person, destruction of property, disorderly person, disturbance-loud music, dog bite, dog at large, domestic problem, drag race, drive-by shooting, driving while intoxicated, drunk, emergency traffic, family domestic disturbance, felony assault, fight, fire, forgery, found property, gambling complaint, gang fight, heart attack, hit & run, holdup, homicide-all types, hostage situation, hot pursuit, indecent exposure, injured animal, intoxicated person, jail break, kidnapping, larceny, livestock carcass on highway, liquor violation complaint, malicious mischief, mental subject, missing person, money transport, murder, noisy party, notify coroner, operating under the influence, operator license check, overdose, parking violation, pedestrian struck, person down, person with a gun, personal assault, pin-in, pollution complaint, possession of narcotics, prisoner escape, prisoner transport, prostitution complaint, prowler report, purse snatching, rape, reckless driving, riot, road blocked, robbery in progress, runaway, serving subpoena, sex offender, shoplifting, silent alarm, soliciting, stabbing, stalking, stolen bicycle, stolen vehicle, suicide, suspicious person, suspicious vehicle, SWAT request, terrorist attack, theft of vehicle in progress, till-tap, traffic accident, traffic hazard, traffic stop, trooper needs emergency assist, trouble at city jail, urinating in public, vehicle rollover, wanted & reported to be dangerous, weather & road condition, welfare check, worthless check, wrecker needed, and much more on your new Bearcat TrunkTracker scanner. You want it. We got it. Order your Bearcat 235XLT today.

Call 1-800-USA-SCAN

COMMUNICATIONS ELECTRONICS INC.

For over 28 years, thousands of radio operators have depended on police radio scanners, digital voice loggers, Ham/CB/GMRS transceivers, weather forecasting equipment and more from Communications Electronics. To get your free fax catalog, call 313-213-1000 from the telephone handset on your fax machine and follow recorded voice prompts.

With the Bearcat 235XLT, now you can track both sides of a conversation even if the channel changes between replies.

Conventional scanning is a simple concept. You enter a radio frequency into your scanner that is used by someone you want to monitor. For example, the police may broadcast on 155.370 MHz, the fire department on 154.250 MHz, emergency management on 158.760 MHz. So when your scanner stopped on a frequency, you usually knew who it was and, more importantly, you could stop on the frequency and listen to an entire conversation. This type of scanning was easy and fun.

As the demand for public communications increased, many public radio users didn't have enough frequencies to meet their needs, which created a serious problem. Trunking systems solved this problem. Since very few, if any, radio users really broadcast on their frequencies all the time, it was possible to use available public service bands much more efficiently.

In a trunked radio system, which contains between 3 and 29 different frequencies, radio users are assigned to talk groups, each with a specific ID number. When someone in a talk group uses their radio, subaudible identification information is broadcast along with each transmission. The trunking system computer uses this subaudible information to temporarily assign each radio in a talk group to an available frequency. If the group using a frequency stops broadcasting or pauses between replies for a few seconds, they are removed from the frequency so another talk group can use it.

Sharing the available public service frequencies allowed cities, counties, states and other agencies to accommodate hundreds of users with relatively few frequencies. On the other hand, following a conversation on a trunked system became difficult if not impossible because if the conversation you were listening to stopped transmitting long enough, it could be assigned a completely different frequency in the trunking system. This type of scanning was difficult and frustrating.

The Bearcat 235XLT TrunkTracker available from Communications Electronics changes all that. Not only does the Bearcat 235XLT search frequencies like conventional scanners, it can also follow the users of a trunked radio system. Once you know a talk group's ID, you won't miss any of the action. Order today. Call anytime 1-800-USA-SCAN to order your scanner now.

Bearcat® 235XLT-A TrunkTracker

Mfg. suggested list price \$429.95/CEI price \$269.95
300 Channels • 10 banks • Trunk Scan and Scan Lists
Trunk Lockout • Trunk Delay • Extra battery & charger
10 Priority Channels • Programmed Service Search
Size: 2-1/2" Wide x 1-3/4" Deep x 6" High

Frequency Coverage:

29,000-54,000 MHz., 108.174 MHz., 406-512 MHz., 806-823.995 MHz.,
849.0125-868.995 MHz., 894.0125-956.000 MHz.

The Bearcat TrunkTracker BC235XLT, is the world's first scanner capable of tracking a selected radio transmission as it moves across a trunked radio system. Now it's easy to monitor fleets and subfleets in analog trunked radio systems. The BC235XLT can also work as a conventional scanner. This 300-channel, programmable handheld scanner provides scanner users with uninterrupted monitoring capabilities of Type I, II, III and hybrid trunking systems. One of the biggest obstacles in the scanner industry has been the increasing use of trunking radio systems in business and public service agencies throughout the United States and Canada. This makes it nearly impossible to track a conversation as it moves within a trunk system from frequency to frequency. According to Ken Ascher, WB8LIT, Chairman & CEO of Communications Electronics, "The Bearcat 235XLT is a revolutionary breakthrough in scanner technology. Now it's easy to continuously monitor conversations even though the message is switching frequencies." For maximum scanning pleasure, order the following optional accessories: UA502 Cigarette lighter power cord for temporary operation from your vehicle's cigarette lighter \$14.95; LC235 Deluxe swivel leather carrying case \$34.95; ANTMBC Magnetic mount scanner antenna with BNC jack and 12 feet of cable \$29.95. ANTGBNC Glass mount scanner antenna with BNC cable \$29.95. The BC235XLT comes with AC adapter, CRX120 battery charger, two rechargeable long life ni-cad battery packs, belt clip, flexible rubber antenna, earphone, owner's manual and one year limited Uniden warranty. Not compatible with AGEIS, ASTRO, EDACS, ESAS, and LTR systems. Call 1-800-USA-SCAN to order your Bearcat 235XLT today.

**TrunkTracker Fax-Back Hotline
Call 313-213-1000 from
your fax machine for an
owners manual or info.**

"The Bearcat 235XLT TrunkTracker is the biggest engineering breakthrough in radio scanners achieved in the last decade."

Ken Ascher, WB8LIT
Chairman & CEO
Communications Electronics Inc.

\$269.⁹⁵

Order yours today
Call 1-800-USA-SCAN

Buy with confidence

It's easy to order from us. Mail orders to: Communications Electronics Inc., P.O. Box 1045, Ann Arbor, Michigan 48106 USA. Add \$17.00 per weather station or radio product for UPS ground shipping, handling and insurance to the continental USA unless otherwise stated. Add \$12.00 shipping for all accessories and publications. Add \$12.00 shipping per antenna. For Canada, Puerto Rico, Hawaii, Alaska, Guam, P.O. Box or APO/FPO delivery, shipping charges are two times continental US rates. Michigan residents add state sales tax. No COD's. Satisfaction guaranteed or return item in unused condition in original packaging within 61 days for refund, less shipping charges. 10% surcharge for net 10 billing to qualified accounts. All sales are subject to availability, acceptance and verification. Prices, terms and specifications are subject to change without notice. We welcome your Discover, Visa, American Express or MasterCard. Call anytime 1-800-USA-SCAN or 1-800-872-7226 to order toll-free. Call 313-996-8888 if outside Canada or the USA. FAX anytime, dial 313-663-8888. Dealer and international inquiries invited. Order from Communications Electronics Inc. today.

For credit card orders call
1-800-USA-SCAN
Communications Electronics Inc.
Emergency Operations Center
P.O. Box 1045, Ann Arbor, Michigan 48106-1045 U.S.A.
For information call 313-996-8888 or FAX 313-663-8888



Domestic DX and the Internet

Some would argue that the Internet has been one of the worst things to happen to the radio hobbies. It's stiff competition — it attracts technically-minded young people, it's good experience towards some of the most lucrative professions that exist today, and it doesn't require those "ugly" antennas that parents and neighbors abhor.

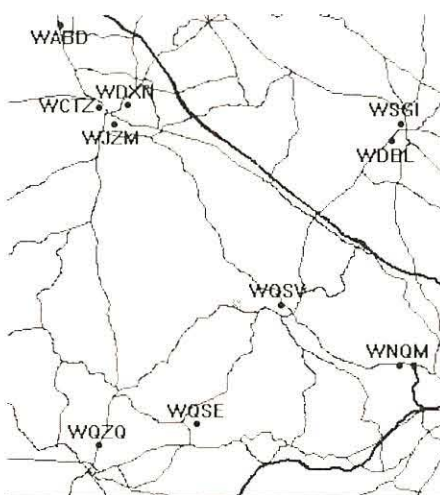
But the 'Net is also a valuable resource for the radio hobbyist, regardless of what bands you DX. A fantastic variety of information is available at the click of a mouse. While I couldn't possibly cover every relevant site in this column, this month I will cover a few of the more interesting and informative sites for the domestic-band DXer.

The obvious starting point is the FCC, at www.fcc.gov. Look under Bureaus, Mass Media. This site contains just about every official FCC document relevant to broadcasting. It includes the Public Notices of applications for new stations and changes to existing stations. There's a search area to find information on specific stations, and you can download the engineering databases which contain technical information on all U.S. broadcasting stations. (However, you'll need to be fairly handy at programming to use them.) A similar site exists for Canada's regulatory agency: look at www.crtc.gc.ca/eng/news/whatsnew.htm.

Radio hobbyists of all kinds should certainly have a bookmark for www.anarc.org. ANARC is an "umbrella" organization for radio hobby clubs in North America, and has membership information and Web page links for all of its member clubs. If you want to know if there's a club for your specialty, this is the place to look.

Of course, don't forget to stop by MT's own pages on www.grove.net! You'll find more club information, last-minute news, as well as the Grove catalog of available equipment for the DXer. Another good general page is www.inforamp.net/~funk. Operated by Werner Funkenhauser of the Ontario DX Club, this site contains the WHAMLOG files of AM broadcast stations — along with links to a wide variety of other sites relevant to the domestic DXer.

Database search pages exist in several places. www.radiostation.com is probably the most popular. But Werner Funkenhauser's



www.jagunet.com/~kodis/station.html links to the U.S. Government's "Tiger" mapping site. This allows you to make maps like this one, showing the tower sites of several AM stations northwest of Nashville.

page also links to www.jagunet.com/~kodis/station.html. This site allows you to find all stations within a given distance of a particular location (handy if you're looking at buying a new house and don't want a 50 kW powerhouse in your back yard!), and plot them on a map.

A less useful but more entertaining feature is available if your browser can display QuickTime™ movies. WNEW-FM (102.7) New York has a Web page at www.wnew.com. Under their homepage at [/qtvr/wnew7681.mov](http://qtvr.wnew7681.mov) is a "pannable" picture of the WNEW studios. By dragging the mouse around, you can look around the studio and see the various equipment (and people) involved in keeping a major-market radio station on the air.

■ New and Old

Many DXers are also history buffs. If that includes you, be sure to take a look at Jeff Miller's Collection on members.aol.com/jeff560/jeff.html. Jeff has accumulated a fascinating set of articles on

the early days of AM, FM, and TV broadcasting, both in the country as a whole and in his native West Virginia. This page is a definite must-read for the fan of radio history. Another good collection of historical items is on www.aa.net/~rfs; these pages cover the history of broadcasting in San Francisco. There's also information on NBC's West Coast operations in the 1930s and 1940s.

If your interest is not in old stations, but old receivers, then you want to look at the Radio History Society. At www.radiohistory.org, this site is full of pictures of old radios. It also contains information on trading and restoring these collectors' items, a entire hobby in itself.

Some readers prefer real, physical, paper-and-cardboard books. The Grove Software & Books Catalog lists a variety of excellent historical titles. Take a look on the 'Net at www.grove.net/hmpgcat.html or write for a copy.

■ Afraid of heights?

If you aren't, here's an opportunity for you! Last month, you read about the assignment of DTV channels and the FCC accepting applications for digital television licenses. Shortly after I wrote that, an item appeared in several local newspapers highlighting the shortage of qualified tower crews.

All TV stations will be required to install a second transmitter and, in most cases, a second antenna for digital broadcasting. Many stations will be able to use their current tower for the new equipment. But in many other cases, the existing tower isn't strong enough and a new tower (or extensive reinforcement of the existing tower) will be necessary.

The problem is, only three companies in North America make tall towers! And there are fewer than 20 crews qualified to work more than 1000 feet (300 meters) above ground. Current calculations indicate it will be simply impossible for



Welcome to the Radio History Society



The Radio History Society, at www.radiohistory.org, has a fascinating Web site for those interested in collecting old radios.

the people available to do all the work necessary.

Bits and Pieces

- Jack Little in the Toledo, Ohio, area is hearing a new and rather strange FM station.

CALL LETTER CHANGES

The following stations have changed callsigns:

Old call	New call	Location
KOSG-1450	KNHD	Camden, AR
KMJI-1380	KTZK	Sacramento, CA
KXOA-1470	KQPT	Sacramento, CA
KHTX-1460	KDON	Salinas, CA
KWNK-670	KVCA	Simi Valley, CA
KPAG-1400	KWUF	Pagosa Springs, CO
WWNN-980	WHSR	Pompano Beach, FL
WRBD-1470	WWNN	Pompano Beach, FL
WITK-1600	WNML	Warner Robins, GA
WSCR-820	WYPA	Chicago, IL
WEJM-950	WDBI	Chicago, IL
WJJD-1160	WSCR	Chicago, IL
WXKN-680	WNAI	Newburg, KY
WTAC-600	WSNL	Flint, MI
WCUZ-1230	WTKG	Grand Rapids, MI
WZQR-1350	WTZK	Black Mountain, NC
WRAQ-1240	WSQL	Brevard, NC
WLVN-880	WTZY	Fairview, NC
WYCM-1080	WWDR	Murfreesboro, NC
WUSS-1490	WGYM	Atlantic City, NJ
KORK-920	KBAD	Las Vegas, NV
WPGY-1520	WINW	Canton, OH
WCOL-1230	WFII	Columbus, OH
KRPT-850	KJON	Anadarko, OK
KWSA-1070	KRAM	West Klamath, OR
WNZT-1580	WVZN	Columbia, PA
WDSY-1080	WPGR	Pittsburgh, PA
KNTS-1470	KBBA	Abilene, TX
KWTR-1530	KNEZ	Georgetown, TX
KTOL-1280	KLDY	Lacey, WA

"Jack and Jill Radio" operates on 107.1 MHz. This very low power station serves to promote the day-care center of the same name. It can be heard only at the corner of Jackman Road and Elanor Avenue in Toledo. Other similar stations have been heard advertising homes for sale. And here in Nashville, on Music Row, I've heard one advertising the latest releases of various country stars.

- The first application for regular operation in the expanded band has been filed, by a Texas station wanting to move to 1700 kHz. I expect more to be filed soon. Remember that WJDM and KXBT are authorized under a special law applicable to a very limited number of stations. No DTV applications have yet been filed, but I expect to see some very soon.
- KNOB-540, which has been authorized to move to 1650, has not yet completed that move. The frequency change is now expected in August or September. However, the co-owned 540 station in Tijuana, Mexico. (XETIN) has now gone to classical music in English, using the slogan "X-Bach."

Another Spanish-language station in California, KOFY-1050 San Mateo/San Francisco, is also switching to an English-language format. KOFY will become an all-sports station.

The sporadic-E season is now winding down, but the AM band should be getting quieter, and better for DX. Have you heard anything interesting? Pass along your DX to P.O. Box 98, Brassstown NC 28901, or via the Internet to 72777.3143@compuserve.com. Good luck!

The ZEIT

by ARCRON
RADIO-
CONTROLLED
CLOCK



- All World Time Zones with Precise Time
- Tell Time by the Atomic Clock that governs time for radio stations and space flights
- Sets Self By The NIST Radio Waves - WWVB Signal

Time, Hours, Minutes, Seconds
Reception/Signal Strength
Date or 2nd Time Zone
BackLight Dial for Night

US and World Time
All World Time Zones
ARC Program Symbol
Dual Alarm Function

Keeping Exact Time HASN'T BEEN EASIER!!

You'll never have to set the time again. Automatically sets accurate time, date and adjusts for the start and end of daylight savings time

- Receives Radio Signal from US Atomic Clock
- Superior Signal Sensitivity (Below 20µV/m)
- Continuous Oscillator Calibration
- Internal Quartz Oscillator
- Integrated Internal Ferrite Omnidirectional Antenna
- Battery Operated with Low Battery Indicator
- High Tech Design
- Warranted
- 2.60" x 5.30" x 4.45"

Only \$79.95

+ S&H \$6.95 *Travel Model

NEW
SPECIAL
PRICE

ORDER TODAY — TOLL FREE 24 HOURS

1-800-985-TIME (8463)

**Radio Controlled Wall Clock
available from \$79.95.**

M/C • VISA • DISCOVER • AMEX
2ND DAY DELIVERY AVAILABLE
30-day Money Back Guarantee

Call or write for free brochures

Arcron-Zeit Co.,

1010 Jorie #324, Oak Brook, IL 60521;

Call 630-472-9999 International;

Fax 630-575-0220 or

www.arctime.com

Pirate Loggings Explosion!

The volume of North American pirate activity has been enormous during the past month. We've rarely seen such concentrated broadcasting on shortwave from unlicensed broadcasters. Our readers heard the activity, so our coverage this month is dominated by the huge number of pirate transmissions that have blanketed 43 meters. We thank the dozens of reporters who enjoyed the frenzy of pirate transmissions from 52 different stations!

■ Metallica Retiring Already?

In the July *MT* we broke the news of Dr. Tornado's superpowered 15,000 watt pirate transmitter. During the past month he often took to the airwaves every day, using the pop oldie "Secret Agent Man" as a theme song. But, *MT* readers Shawn Axelrod of Winnipeg, Manitoba, Rich/Talea Jurens of Katy, Texas, and Bill McClintock of Minneapolis, Minneapolis, were startled by his announcement on June 7 that Metallica's transmitter would be dismantled. Dr. Tornado previously said that his homebrew 10 kW rig used four CX500's in its final, driven by a Kenwood TS-450 as an exciter.

Pirates have sometimes announced their retirement prematurely, as we see from **Radio Free Speech** in our loggings. Such seems the case with Dr. Tornado, as Metallica continues to be heard, and has even announced a maildrop. Broadcasts from Metallica have caused worldwide interest in North American pirate programming.

■ Radio Free London

Even though it's summertime, Europirate stations sometimes put an audible signal into the east coast of North America. Ross Comeau of Andover, Massachusetts, sends in an example. He heard **Radio Free London** on 6275 kHz for an hour at 0200 UTC. This part of the 49 meter band is a good place to find European pirates; they also commonly use 3900-4000 kHz in what is the 80 meter ham band on this side of the Atlantic.

■ Micropirates

We have two FM micropirate logs to report. Harold Frodge of Midland, Michigan, says that **Tower Boy Network** is using 88.3 MHz in his area with an album rock format, sometimes spiced with blues, rag, and oldies. *The Cleve-*

land Free Times ran a cover story on **Grid Radio**, which uses 96.9 MHz to transmit dance music from their gay dance club in downtown Cleveland. I hear them nightly east of West 117th Street.

■ What We Are Hearing

Your pirate loggings are always welcome via PO Box 98, Brasstown, NC 28902, or via the e-mail address at the top of the column. All frequencies are in kHz, with times in UTC.

North American pirate stations listed here use the following addresses: PO Box 1, Belfast, NY 14711; PO Box 109, Blue Ridge Summit, PA 17214; PO Box 28413, Providence, RI 02908; PO Box 146, Stoneham, MA 02180; and PO Box 11522, Huntsville, AL 35814, Postfach 220342, D-42373 Wuppertal, Germany; and PO Box 3103, Napier, New Zealand. For return postage, enclose three 32¢ stamps in the envelope to USA addresses. \$2 US or two International Reply Coupons go to foreign maildrops.

Summer is still here, so the 39 meter pirate band supports activity during evening hours until 0500 UTC or later; the times in our loggings confirm this.

Anteater Radio- 6955 at 0230. The rock shows from this one sometimes are said to come from Duluth, MN. Addr: Belfast. (Terry Hartsell, Muskegon, MI; Kevin Nauta, Grand Rapids, MI; Michael Prindle, New Suffolk, NY; Basil Shelley, Blythe, CA; Frodge; Jurens; McIntock)

Attention 69- 6955 at 0130. Programming on this new one is sufficiently obscene that we can't really describe it in this family publication. Addr: None. (Frodge; Jurens)

Big Johnson Radio- 6955 at 0245. Rock music and suggestive novelty tunes are regular features on this pirate. Addr: Providence. (William Hassig, Mt. Prospect, IL; Jurens; McIntock)

Black Rock Radio- 6957 at 0300. This rock music station claims to come from the high desert, and it's best heard on the west coast. Sometimes they insert animal noises in the shows. Addr: Blue Ridge Summit. (Randy Ruger, North Hollywood, CA)

Cherokee Radio- 6955 at 0330. Although they use the slogan of "Native American Broadcasting," the program content is mainly rock music. Note their new maildrop! Addr: Blue Ridge Summit. (Lee Silvi, Mentor, OH; Jurens; Shelley)

DC Radio- 6955 at 0045. The Morse code message on this one is always, "Don't Vote Republican." Addr: None. (Harald Kuhl, Giessen,

Germany; Kathy McIntyre, Richmond, VA; Jose Campos, Annapolis, MD; Silvi)

FBI Radio- 6955 at 0230. As we see here this month, the women at "Females Broadcasting Interference" are sending out nice new QSL's. Addr: Huntsville. (Jurens; Prindle; Silvi; direct from the station)

Free Hope Experience- 6955 at 0000. Major Spook's diverse programming often promotes pirate radio. Sometimes he transmits "FHX" Morse code identifications during broadcasts. Addr: Blue Ridge Summit. (Joel Rose, Brecksville, OH; Barry Williams, Enterprise, AL; Comeau; Jurens; Nauta; Silvi)

He Man Radio- 6955 at 2300. He Man is back, broadcasting his masculine point of view in Upper Sideband, the "manliest of all modes." Addr: Blue Ridge Summit. (Silvi)

KGDR- 6955 at 0230. They remember Jerry Garcia, and they transmit Grateful Dead music. Addr: Providence. (Hassig; Jurens; McIntock)

KIRK- 6955 at 0130. Don't be confused with the elaborate sound effects on this one that include the ID's of a dozen pirates. If you listen carefully, you can hear their Voice of the Ozarks slogan. Addr: None. (Frodge; Hartsell; Silvi)

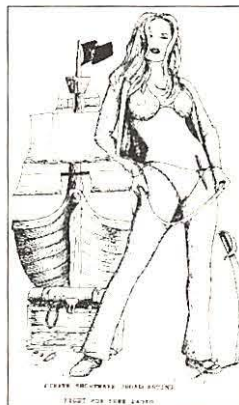
KIWI- 7475 at 0700. Graham Barclay's New Zealand pirate, which relays several other stations regularly, has announced that they will cease broadcasting on shortwave after the summer. Say it ain't so! Addr: Napier. (Robert Ross, London, Ontario; Jurens; Ruger; Silvi; Williams)

KMCR- Magic Mike and Wanda at Magic Carpet Radio have added Cajun music to their rock programming. Here's another one that puts out good signals on the West Coast. Addr: Blue Ridge Summit. (Ruger; Shelley)

KRAP- 6955 at 0100. If it weren't for Metallica, Fred Flintstone's potent signal would be considered a powerhouse. His rock comes through with fine audio on a strong AM carrier. Addr: Blue Ridge Summit. (Gregory Majewski, Montville, CT; David Krause, Eastlake, OH; Paul Jablonowski, Greenfield, WI; Kim Campbell, Piedmont, SC; Chris Leagus, Bangor, ME; Jeff Ryan, Yardley, PA; Neil Wolfish, Toronto, Ontario; Chris Lobdell, Stoneham, MA; Axelrod; Frodge; Hassig; Jurens; Nauta; Prindle; Silvi; Williams)

Lounge Lizard Radio- 6955 at 1800. Allegedly coming from a motel in Steubenville, OH, their unusual format consists of syrupy night club lounge music. Addr: Providence. (Frodge; Jurens; Nauta; Ryan; Silvi; Williams)

Mystery Radio- 6955 at 0200. The haunting instrumental rock on this one is highly distinctive. Addr: Stoneham. (John Sedlacek, Omaha, NE; Scott Krauss, Cleveland, OH; Frodge; Jurens; Prindle; Shelley; Williams)



FBI Radio: Obviously not the Federal Bureau of Investigation

"The World of Ham Radio"

A Gem of a CD

Have you ever stumbled onto something truly valuable? Remember the surprise, the thrill? You can experience that same feeling when you examine a copy of the CD ROM software by AMSOFT called "The World of Ham Radio"! This is one of the best bargains I have laid my hands on in a long time.

This CD has been around for a few years, and I have seen it for sale at several hamfests. Several years ago I looked at it and felt the CD provided a decent call book with some nice software.

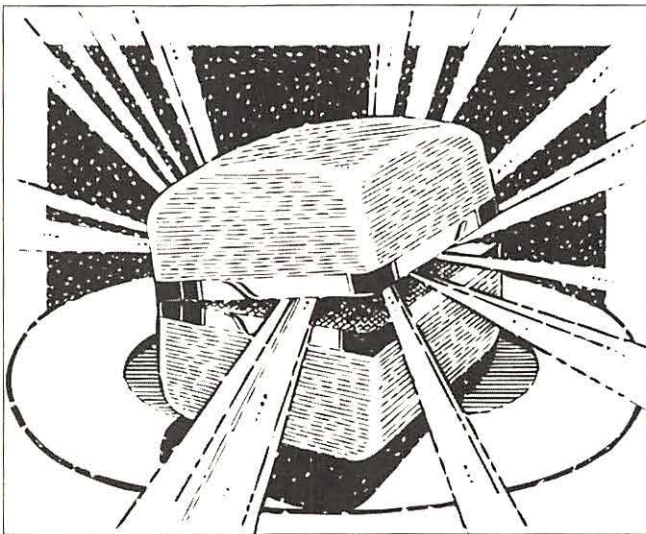
The latest copy, however, knocked me over! I held a copy of it for several weeks before giving it the once over, but after I started I couldn't stop. Programs that I had on separate disks were available in one location with an excellent menu, and moreover, they would run directly from the CD. For many years I have collected shareware at a price of 2 to 6 bucks a disk, finding many I liked, but a lot more that were just ho-hum. If I were to add up the cash laid out to come up with a handful of decent programs I am sure it would be several hundred dollars.

"The World of Ham Radio" is a collection of excellent software; in fact, almost all of the programs I have chosen over the years as being the best are on this CD, plus a lot more, to boot. All of this and a call book, too! Looking up a call is a snap in AMSOFT's "World of Ham Radio." But, let me give you a brief tour of what else is on this CD.

When you type CDVIEW, a listing of many different subjects is presented to you. Choose "Antennas," for example, and you will find 26 different antenna programs that will provide full information on a host of antennas, from simple long wires to yagi and complex loop antennas.

"Basic programs" are a wide range of simple programs written in BASIC which will run directly from the CD. Examples of the Basic listings vary from antennas to z calculations.

Twenty-six different programs deal with



Morse code — from learning programs to programs that will allow you to send Morse from your computer keyboard as well as copy code via the computer and shack receiver.

A variety of engineering programs are included, among which are a simple-to-use CAD program for drawing schematics, a program to lay out PC boards, and tools for designing specific circuits.

Eight different logging programs give you anything you want for contest logging, general logging, and certificate hunting.

One program I particularly like is a training manual for the oscilloscope. As you go through the Oscope manual the computer shows demonstrations of what will appear on the screen of your oscilloscope under different testing situations. Last Christmas a good friend wanted more info on using an oscilloscope and we spent several weekends going over the use of this instrument in my shack. If we had had this program, I am sure my friend would have learned a lot more a lot faster.

Equipment modifications also are included on the "World of Ham Radio" CD. I examined all of the mods available on the CD and am anxious to try several, especially one for a scanner I have. Not every piece of equipment is covered, but there is a lot!

Eight propagation programs allow the

user to determine the best time and frequency to work various parts of the world.

Included are 36 packet programs from very simple to very elaborate terminal programs, information on using packet, and circuits for various packet projects. If you ever wanted to try RTTY, 10 programs on this CD will let you get your feet wet in this interesting mode with minimum outlay.

A very interesting listing for satellite communications provides info on operating and tracking programs, again from simple to fairly complex. There are several programs for SSTV and WEFAX

that I am just now beginning to explore.

As always, there is a "Miscellaneous" listing containing 89 programs which I have only begun to explore. There is also a question and answer section that deals with many subjects. Scanner buffs and SWLs will find a lot of good information on this CD: frequency lists, data bases, modifications, and more.

In short, "The World of Ham Radio" gives you hundreds, if not thousands of dollars worth of information on ham radio, and all at a price of \$29.95! If you have a CD drive on your computer, grab a copy ASAP. If you don't have a drive, consider putting one on your machine just so you can use this super CD.

"The World of Ham Radio" is available from AMSOFT, P.O. Box 666, New Cumberland, PA 17070 or order by calling 1-717-938-8249.

■ The Web

I have recently been asked why I am not active on the Web. To be honest, I have little interest in the Internet, partly because my time is quite limited due to my involvement in so many other projects. But I still welcome contacts; just drop me a letter via "MT" or to my home address at 6347 Chapmans Road, Allentown, PA 18106. Good hamming!

Note on advertisement below: As of 4/26/94 it became unlawful to market cellular-capable receivers in the U.S. Atlantic Ham Radio assures us that it will give a full refund and hold customers harmless from shipping expenses if a purchased unit is returned to the vendor by US Customs.

We have Scanners with 800MHz coverage!

AOR AR-8000, 3000, 5000
Yupiteru MVT-9000, 7100, 8000
ICOM R9000, R8500, R100, R10
Scout Ready!
Win-Radio for PC 500Khz-1300Mhz coverage
OPTOELECTRONICS Xplorer

AOR AR-8000

500KHz ~ 1900Mhz coverage
 AM/NFM/WFM/USB/LSB/CW Modes
 50 x 20 banks = 1000 memories
 Ferrite Rod Antenna below 2Mhz
 Computer Control interface
 Selectable Step Size
 True SSB (Lower and Upper)



We do Modifications for your Scout!
 All Orders Shipped by Air

ATLANTIC HAM RADIO LTD.

(416) 636-3636 ahr@interlog.com 368 Wilson Ave
 (416) 631-0747 (fax) Downsview, ONT
 www.interlog.com/~ahr/scan.htm Canada M3H 1S9

SCANNERBASE frequency guide

- Search Wizard guides users through the powerful search process.
- Locate records spanning the entire country in one search.
- Millions of records from the FCC's frequency database.
- Easy to use program on CD-ROM runs on Windows 95 and Windows 3.1.

Download a free demo
 from our web site
 www.csp-tech.com
 or call toll free to order today!
 1-888-857-4240

**ONLY
\$29.95**
 Plus Shipping
 & Handling

A product of CSP Technologies, Parsippany, NJ



FERRELL'S CONFIDENTIAL FREQUENCY LIST 10th Edition

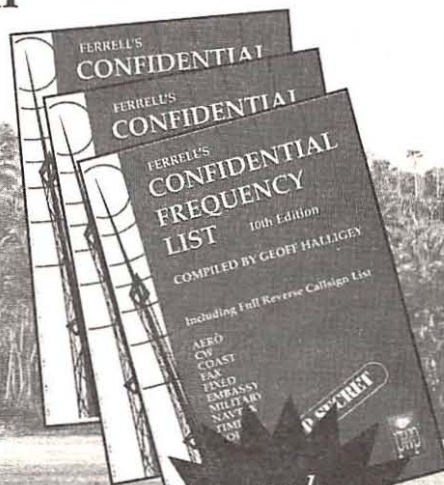
**AVAILABLE NOW FROM THE
FOLLOWING STOCKISTS:-**

Electronic Equipment Bank
 Tel: 800 368 3270

Grove Enterprises
 Tel: 800 438 8155

Radio Bookstore
 Tel: 800 457 7373

Universal Radio
 Tel: 800 431 3939



only
\$24.95

PW Publishing Ltd.

Freeport Arrowsmith Court, Station Approach, Broadstone,
 Dorset BH18 8PW, England.

Tel: (+44) 1802 659950 FAX: (+44) 1802 659950 E-mail: sales@pwpub.demon.co.uk

Radio Artwork From Your PC

Many of the projects I describe in this column call for breadboard construction. Others are designed to be assembled with point-to-point wiring on a scrap piece of PC board. Some readers have indicated a desire to obtain an etching pattern for a PC breadboard, because they want the project to look neat and professional. This month I am responding to those requests by providing some breadboard patterns I developed for my personal use. You will be able to make circuit boards from these patterns while using ordinary materials that are available by mail.

■ Creating the Artwork

Figure 1 contains three breadboard patterns for the workbench enthusiast. Two are identical in layout, but one is smaller than the other. A third pattern is provided for those who work with ICs. Two 16-pin IC sites allow the use of standard DIP ICs from 4 to 16 pins. This pattern must be maintained to scale, as provided here. Otherwise, the ICs will not fit into the allocated spots. The other two breadboard patterns may be enlarged or reduced in size with a copy machine to provide the size you prefer.

Patterns such as those in figure 1 can be developed easily with a computer. If you do not have CAD software for drawing schematic diagrams and creating PC-board patterns, you can accomplish the same end result by using Paintbrush in Windows. I use Windows 3.1 in my system. Windows 95 should be satisfactory for this purpose also.

The patterns illustrated in this article were developed while using Boardmaker software, which is a European CAD program.¹ At least two U.S. programs are suitable for this application (PCboards and SMARTWORK).

■ Etching the Boards

One of the better etching products to appear on the market in recent years is Press-n-Peel PnP Blue film produced by Techniks, Inc. It is available from All Electronics in 8-1/2 x 11 inch five-sheet packets.² The figure 1 patterns are transferred to the PnP Blue film with a standard laser copy machine. The pattern on the PnP Blue is then transferred to a piece of clean PC board with a household iron set for silk or cotton.

Approximately one minute of moderate pressure with the iron (keep the iron moving slowly to ensure a complete pattern transfer) is required. Allow the work to cool, then carefully peel the PnP Blue from the PC board. A black etch-resist coating will remain on the board for those copper areas that are protected from the etching solution. Ironing the pattern onto the board causes a mirror-

image reversal, and hence the backward-reading labels in figure 1.

If there should be spots on your PC board where the PnP Blue did not transfer (dirty copper surface or insufficient heat), you may protect those areas with India ink, or with an etch-resist pen.

Ferric chloride etching solution is available in pint bottles at Radio Shack stores.

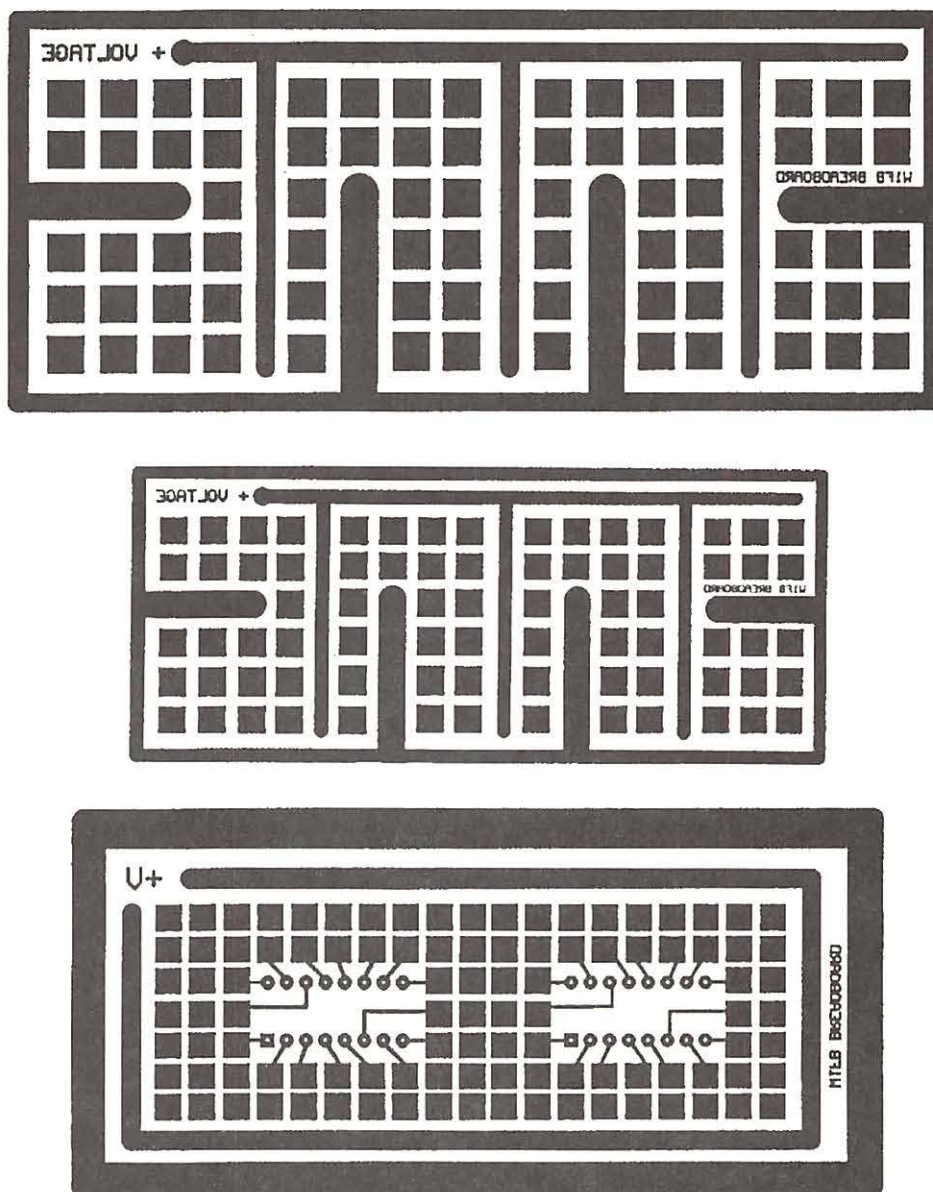


FIGURE 1 — Scale etching patterns for two general-purpose breadboards and one that contains sites for two ICs.

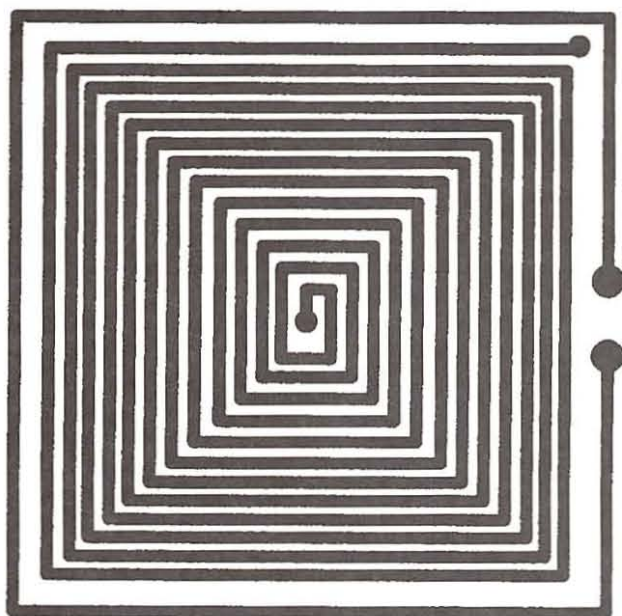


FIGURE 2 — Scale etching pattern for a PC-board coil that has 4.2 microhenries of inductance and a Q of 100.

Alternatively, you can purchase (see reference 2) ferric chloride powder and mix your own etching solution with water. The liquid etchant should be preheated to approximately 100-110 degrees F before the work is placed in it. I do this in a pyrex dish in the microwave oven. **Caution:** Avoid contact with the etchant and do not breathe the fumes. Ammonium persulfate powder may also be mixed with water to provide an etchant.

Agitate the PC board every 30 to 60 seconds during the etching period to hasten the removal of unwanted copper. Most PC boards will etch in 30 minutes or less. The etching time depends upon the thickness of the copper.

Once etched, the PC board should be cleared of remaining etch-resist material by treating it with paint remover or a similar solvent. It can then be washed with warm water and dried with a paper towel. The board may be tin plated by immersing it in tin-plating solution. Tin-plating powder is available from most suppliers of PC board materials, or in liquid form from Kepro Corp. Tin plating makes soldering easier, while protecting the copper conductors from corrosion.

■ A PC-Board Coil

Figure 2 shows a pattern I developed for experimental purposes. It is a flat coil made with etched conductors. The format is similar to that used in the 1930s for loop antennas in some BC band radios. The greater the number of turns the higher the coil inductance, and vice-versa. The figure 2 coil has an inductance of 4.2 microhenries. The measured Q

(on phenolic PC board stock) is 100. The coil can be tapped to lower the inductance (using a rotary switch) in circuits that require a variable inductor. A single-turn loop is on the outer perimeter of the board for use as a coupling link.

This inexpensive approach to coil fabrication lends itself to the construction of compact, low-profile equipment. The inductance can be reduced by placing a brass or aluminum plate on the back side of the PC board. A sliding brass or aluminum plate would make the coil a variable inductor.

In a like manner, a small sheet of powdered iron (pulverized no. 2 or no. 6 toroid material mixed with a binder)

may be placed on the back side of the PC board to increase the inductance. Those who are mechanically inclined should find it easy to make a variable inductor along the foregoing lines.

■ Some Closing Remarks

Breadboards are suitable for finished product fabrication. They can be used again and again for experimental circuits before the copper conductors lift from the phenolic or glass epoxy base material. Always use the least soldering-iron heat practicable to ensure long life for the breadboards. Double-sided PC board stock may be used if you wish to have a ground-plane surface on the non-etched side of the board.

Commercially made versions of the boards in this article may be available. Check with FAR Circuits.³

The plus voltage and ground buses for the two non-IC breadboards in figure 1 are woven into the overall pattern to enable you to keep the power leads short. These lines can be extended into other areas of the pattern by joining them to the square pads with bus wire.

■ Notes

- 1 — Tsien (UK) Ltd., 181A Huntingdon Rd., Cambridge CB3 0DJ, England.
- 2 — All Electronics Corp., 14928 Oxnard St., Van Nuys, CA 91411. Phone: 1-800-826-5432 for catalog or orders.
- 3 — FAR Circuits, 18N640 Field Court, Dundee, IL 60118. Phone: (847) 836-9148 to order.

LONGWIRE BALUN

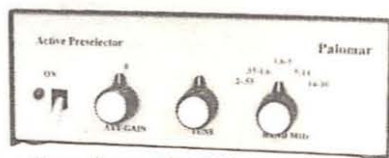
- Use coaxial cable from antenna to receiver.
- Low noise reception from 500 KHz to 30 MHz.

Your longwire may be up in the clear but the wire to the radio picks up noise from light dimmers, TV set, fluorescent lights, etc.

Coax shields out this noise but has far lower impedance than the antenna. Palomar's MLB-1 balun transforms the impedance to give a stronger quieter signal. Static charges go to ground, not through the radio.

Model MLB-1 \$49.95
+ \$6 to ship U.S./Canada.
Sales tax in Calif.

PRESELECTOR



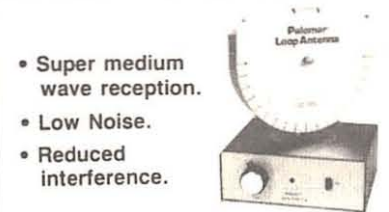
- Hear the weak ones.
- Quieter clearer reception.

Palomar's Active Preselector gives over 20 dB extra gain. Eliminates images and adds selectivity to your receiver. New amplifier circuit reduces spurious outputs. Continuous coverage 200 KHz to 30 MHz.

Model P-508 \$99.95

For 12vDC,
Model PS-90 AC Adapter \$9.95
+ \$6 to ship U.S./Canada.
Sales tax in Calif.

LOOP ANTENNA



- Super medium wave reception.
- Low Noise.
- Reduced interference.

Loop amplifier gives 20 dB gain and sharp tuning. Plug-in loop Model BCB covers 540-1600 KHz AM band. Rotates and tilts to give best possible reception. Other plug-in loops cover 10 KHz to 5 MHz.

Model LA-1 Loop Amplifier . \$99.95

Model BCB Loop \$99.95
Add \$6 to ship U.S./Canada.
Sales tax in Calif.



Send for FREE catalog



PALOMAR

BOX 462222, ESCONDIDO, CA 92046
ORDERS ONLY 1-800-883-7020
ORDERS/TECH HELP 619-747-3343
FAX: 619-747-3346
e-mail: Palomar@compuserve.com

Separation Anxiety

Welcome aboard! Today we are going to look at a concept that is critical in air traffic control: separation. Keeping aircraft separated is a controller's *prime responsibility*. Separations vary according to conditions, but are discussed in three dimensions or physical planes: vertical, longitudinal, and lateral.

Vertical is the separation of aircraft at different altitudes. **Longitudinal** is the separation of aircraft following one another in trail. **Lateral** is the separation of aircraft at the same altitude, most often to the right or left side. In some respects, given today's use of radar, separation could be thought of as basically either vertical or horizontal. Let's examine these standards of separation as they exist in air traffic control today.

■ Vertical Separation

Vertical separation between instrument flight rules (IFR) aircraft is 1,000 feet up to and including flight level (FL) 290 (twenty-nine thousand). Above flight level 290, vertical separation is 2,000 feet. Therefore, controllers can assign aircraft to fly at 10,000, 11,000, and 12,000 feet up to 29,000 feet. But up where the jets like to travel, the altitudes are at flight levels such as 310, 330, and 350.

To provide 2,000 feet of vertical separation above 29,000 feet, only odd numbered altitudes (flight levels) are used. Aircraft at the higher altitudes flying on courses of 360 to 179 degrees fly at FL 330, 370, 410, etc. Aircraft flying courses of 180 to 359 degrees use FLs 310, 350, 390, etc.

According to the Federal Aviation Regulations, VFR aircraft fly at the given altitude plus 500 feet. Thus, for example, they use 10,500, 11,500, and 12,000 feet. VFR aircraft in terminal control areas are also provided 500 feet of separation.

The 2,000-foot separation minimum above FL 290 is based (among other things) on altimeter accuracy problems at those altitudes. During the last several years, an extensive study on altimeter accuracy has investigated the possibility of reducing the separation to 1,000 feet. The study is still on-going.

■ Longitudinal Separation

In today's environment most aircraft are separated by three nautical miles in terminal areas and five nautical miles when under control of the centers. But again, separation criteria are not always so simple.

1. Wake turbulence separation minima. Wake turbulence is a violent disturbance of the air behind an aircraft, resembling a pair of horizontal tornadoes. The bigger and heavier the aircraft, the more violent the disturbance. For wake turbulence purposes, aircraft are divided into three categories: heavy, large, and small. (An MD11 is a heavy aircraft, a 727 is a large aircraft and a Cessna 421 is a small aircraft.) For aircraft flying directly behind, and less than 1,000 feet below, a preceding aircraft, the following separation minima apply:

- a. Heavy behind a heavy - four nautical miles
- b. Small or large behind a heavy - five nautical miles

Near the runway, when the preceding aircraft is over the landing threshold:

1. Small behind a large - four nautical miles
2. Small behind a heavy - six nautical miles

■ Lateral Separation

Lateral separation exists for nonintersecting flight paths under the following conditions:

- a. When the required distance is maintained between the flight paths.
- b. When reduced route protected airspace is applicable, and the protected airspace of the flight paths do not overlap.
- c. When aircraft are crossing an oceanic boundary and are entering an airspace with a larger lateral minimum than the airspace being exited; and the smaller separation exists at the boundary and flight paths that diverge by 15 degrees or more until the larger minimum is established.

However, lateral separation also exists for intersecting flight paths with constant and same width protected airspace when either aircraft is at or beyond a distance equal to the applicable lateral separation minimum measured perpendicular to the flight path of the other aircraft;

Or, for intersecting flight paths with *constant but different* or with *variable* width protected airspace when either aircraft is at or beyond a distance equal to the sum of the protected airspace of both flight paths measured perpendicular to flight path of other aircraft.

There's more to lateral separation, but I think you get the idea by now.

■ An automatic snitch

Separation also leads us into the next subject to be discussed — the Operational Error Detection Patch (OEDP). Also known as the "snitch gear" or "Sally Snitch," the OEDP "blows the whistle" when a controller has lost the required

minimum separation between two aircraft. In essence, it is the automatic detection of an operational error.

When OEDP first became operational, the number of reported errors increased significantly because the program was capable of detecting 4.9 mile separations when the stated requirement is five miles. Controllers could not discern the one-tenth-of-a-mile loss of separation with the naked eye, so they became conservative, increasing the usual separation to seven miles.

Initially, controllers did not greet the OEDP with a great deal of enthusiasm. But now that they have grown used to it and the system is accommodating slightly increased distanced between aircraft, most everyone agrees that the "snitch gear" has made the system safer — and reduced high "separation anxiety."

■ Major World Air Route Areas

Following is a look at a few of the Major World Air Route Area (MWARA) HF networks that help keep air traffic worldwide on track and collision-free:

North Atlantic (NAT)

(NAT-A): 3016, 5598, 8906, 13306, 17946. Air/Ground transmissions across south central part of North Atlantic - Canarias, Gander, New York, Paramaribo, Piarco, Santa Maria, Shanwick. Bounded by Paramaribo, New York, Reykjavik, and Canarias.

(NAT-B): 2899, 5616, 8864, 13291, 17946. Air/Ground transmissions across North Atlantic for aircraft that is registered west of 30 degrees west - Gander, Reykjavik, New York, Santa Maria, Shannon (Shanwick)

(NAT-C): 2872, 5649, 8879, 13306, 17946. Air/Ground transmissions for aircraft registered east of 30 degrees west - Gander, Reykjavik (Iceland), Shannon.

(NAT D): 2971, 4675, 8891, 11279, 13291, 17946. Air/Ground transmissions across furthest northern part of the Atlantic including the north polar region.

(NAT E): 2962, 6628, 8825, 11309. Air/Ground transmissions in Atlantic area between New York and Santa Maria.

(NAT F): 3476, 6622, 8831, 11336, 13291. Air/Ground transmissions in area between Gander and Shanwick.

Caribbean (CAR)

(CAR-A): 2887, 5550, 6577, 8918, 11396, 13297, 17907. Air/Ground transmissions across southern Mexico, Central America, and northwestern Caribbean region of South America - Barranquilla, Boyeros, Guatemala City, Merida, New York, Panama, Piarco, San Andreas Island, San Jose, Tegucigalpa (Toncontin Int'l).

(CAR B): 3455, 5520, 6586, 8846, 11387, 17907. Air/Ground transmissions across north, west, central, and eastern area of Caribbean regions of South America, including north eastern part of South America - Barranquilla, Boyeros, Cayenne, Georgetown, Maiquetia, New York, Panama, Paramaribo, Piarco, San Andreas Is.

Note on advertisement below: As of 4/26/94 it became unlawful to market cellular-capable receivers in the U.S. Bandercom assures us that it will give a full refund and hold customers harmless from shipping expenses if a purchased unit is returned to the vendor by US Customs.



Full coverage scanners - 800 MHz no-block

World wide sales of full coverage scanners
by Bandercom, Inc.

Best models available at best prices.
Inquire for the best quote before ordering!

Uniden UBC-3000XLT **US\$ 299**
AOR AR-8000 **US\$ 459**
Yupiteru MVT-9000 **US\$ 579**

All including shipping and handling. Visa and MasterCard.
European (EU/EEC) residents please add 15% sales tax.

Brands include **Uniden, Realistic, Icom,**
Yupiteru, Welz...

For complete information send US\$5
(full refund on your order) to:
Bandercom, P.O. Box 48, FIN-15801 Lahti, Finland

Dealer/wholesale distributor inquiries
welcome world wide. US based repairshops
wanted for complete warranty program.
Scanners, Ham Radio, CB, VHF/UHF, Antennas,
Amplifiers etc. Customers in 16 countries.

Bandercom

Tel. 011 358 50 558 0090 Fax. 011 358 50 858 0090

We don't make SCANNERS or the ICOM IC-R8500 RECEIVER - We make them better -

DELTACOMM I-8500 Communication Manager for the ICOM IC-R8500 communication receiver. With speed as a design goal DELTACOMM's QUICK LOG function will log signal level, frequency, mode, date, time and optional Global Positioning System (GPS) coordinates at speeds in excess of 2400 channels per minute. Here are a few examples of the many advanced features DELTACOMM I-8500 has to offer:

- Load 40 channels of information including ALPHA NUMERICS into one of the R8500's memory banks in 3 seconds.
- Separate volume level, resume scan delay and maximum monitor delay plus 40 character information field for each scan channel.
- Priority channel operation samples at 2.5 second intervals.
- Multi-receiver control will hand off active frequency to next receiver on line. Able to control up to 125 ICOM receivers (optional).
- Traditional scanning is a thing of the past with our CYBERSCAN feature, used to track systems employing frequency hopping.
- Activity log function automatically records and calculates total spectrum usage time.
- Unique search operation stores all frequencies found active and then automatically skips those frequencies during the remaining search cycles. This feature eliminates redundant logging.

Visit our Internet Web Page or Phone/FAX us for program features, new product releases and pricing schedule. DELTACOMM is available for ICOM R9000, R7100, R7000, R71, R72, IC-735 (features vary with type of radio). Also check out our DELTATONE 2.0 repeater programmer.

<http://www.execpc.com/~deltacom>

Delta Research  
Box 13677 - Wauwatosa, WI 53213 - FAX/Phone (414) 353-4567



More than a Dozen Reasons To Buy Scanner Master Books!

Monitor America—3rd Edition

A complete listing of public safety and business radio communications—\$29.95;
Order BOK63-95.

Monitor the World

Discover and monitor the frequencies of law enforcement and military agencies in nations
around the world—\$19.95; Order BOK13DS.

National Sports & Recreation Frequency Directory

Thousands of listings for recreational and amusement operations—\$13.95; Order BOK 90.

Scanner Master Guides

Undoubtedly the most accurate and comprehensive scanner/radio guides ever printed.

- Massachusetts Guide—\$29.95; Order BOK11DS.
- Upstate New York Guide—\$29.95; Order BOK44DS.
- Fourth edition D.C., Delaware, Maryland, and Virginia Guide—\$29.95; Order BOK57DS.

• Illinois Communications Guide—\$29.95; Order BOK60DS.

• New York Metro Guide—\$38.95; Order BOK109DS.

Pocket Guides

Includes police fire, ambulance, DPW, emergency management, and other local
government frequencies for every community in each state.

- Massachusetts, Rhode Island & So. New Hampshire, 6th edition with latest
update sheet—\$13.95; Order BOK39DS.
- Maine, New Hampshire and Vermont—\$13.95; Order BOK40DS.
- Chicagoland—\$13.95; Order BOK61DS.
- Greater Philadelphia/South Jersey, 3rd edition—\$13.95; Order BOK55DS.
- New York Metro/Northern New Jersey—\$13.95; Order BOK49DS.

Grove Enterprises, 7540 Hwy. 64 W., Brassstown, NC 28902; (800) 438-8155, (704) 837-9200, Fax (704) 837-2216; www.grove.net

Brave New World of Scanning

The world of federal scanning has taken on an entirely new face over the past month, and those of us that are heavily involved in it are very excited about our "new baby." The first event that occurred is the inauguration of the FedCom mailer on the Internet available through the Grove Web Site. This has brought out the most accurate and timely federal frequency monitoring information that I have seen in the past thirty years—and that's when I got started monitoring the feds.

If you have been following my column, you are aware of the WorldWide Utility Net (WUN) that I brought to your attention in June. FedCom is the same idea, but it is along the lines of federal monitoring instead of utility monitoring, although sometimes the frequency intercepts overlap. To subscribe to the FedCom list, send e-mail to "majordomo@grove.net." In the body of the mail type "subscribe fedcom" or "fedcom digest." Nothing else is necessary. If you are going through AOL, you will have to type something in the subject line or else the mail will not go through. See you on the web!

The second major event is the introduction of the "TrunkTracker" radios.

Over the past few months I have pretty well hashed out the question of where the feds have gone. In many areas of the country, we are hearing less and less on the federal channels. For example, I received an e-mail from someone in law enforcement in a major sheriff's department in Florida. He confirmed our suspicions that the feds have moved up to 800 MHz on the commercial SMR's. (Specialized Mobile Radio systems—a trunked system operated by Motorola). He stated that in the Tampa and Orlando coverage areas, the U.S. Marshal's Office is the first of many federal agencies that are currently making the move to commercial systems. Look for most of the federal agencies in the Central Florida area to be up on 800 within the next few months.

These SMR's are wide area commercial trunking systems, having as many as 20/30 frequencies available on a particular system. On these systems one will find many many commercial systems, from the local pizza delivery service to the pool cleaner to the building contractor. Recent changes in FCC regulations state that the individual users do not have to be licensed, only the trunk system itself. Good luck now finding a particular user!

With more and more commercial systems

leaving their 150 and 460 MHz commercial allocations and showing up on the 800 MHz systems, the feds will become just another face in the crowd—or will they?

I received an e-mail from someone "in the know" with the Bureau of Alcohol, Tobacco, and Firearms (BATF)—another agency that has "disappeared" in the South Florida area from their normal 165 MHz frequencies. To quote the mail: "A couple of weeks ago I was involved in an operation that included personnel from the ATF and the FBI. As we came up on the residence, my trusty Scout popped up with a frequency of 817.614, which I suppose was close enough to 817.6125, an input for a local SMR. It had to be one of those feds, none of the locals would be using that system. I have not heard ATF on their 165-166 MHz frequencies for some time in this area (Toledo, Ohio)."

Well, I guess that answers our question on where to find the feds. Will we have to give up monitoring the assigned federal frequencies? Of course not. Keep them installed in your scanner. But the feds know that people are monitoring their frequencies and they are looking for ways to keep their communications secret.

Why isn't digital encryption all that's required for secrecy? DES works fine, but when a lawbreaker starts hearing digital speech encryption on the input channel for the local DEA or FBI repeater or on a simplex channel, it will not take him long to figure out what is happening. This is what is referred to in the intelligence circles as "traffic analysis." You do not have to know the contents of the message; just the fact that the message is being transmitted tells you a great deal.

Since federal agencies are shifting much of their communications to commercial trunked systems, we are going to have to add to our arsenal of monitoring equipment a "TrunkTracker" or its equivalent. In the past, monitors have sometimes obtained trunked radios at hamfests and attempted to get them set up for their own use — thereby risking a lawsuit from Motorola or worse. But now, the rest of us will be able to use the new, legal, scanners that will follow the trunked systems.

There is already a trunktracker internet mailer on the Grove.net server, and a web site at www.trunktracker.com for posting of trunking information as fast as it is being discovered. FedCom will list similar information relevant to federal communications. The

lists get bigger each day with *your* contributions.

For those of you that do have web access, welcome to our new world. If you do not have a computer, you are going to have to obtain one or the services of one to keep informed on the latest developments in Federal scanning. The hobby is changing by the day. Do not be left behind.

■ What You are Hearing

I received a lot of intercepts over the past month, both on the FedCom site and by private e-mail. Let's get to them.

A contributor in the **Boston, Massachusetts**, area submitted the information that there was an active federal trunking system installed in downtown Boston. The system was installed and then no users showed up on the channels. (Note: The same thing happened with the federal SMR in Miami. The system was unplugged in 1995 but is still there.) The following are the data and control channels:

Pair	Transmit Freq	Receive Freq	Connect Tone
One	408.2000	415.3250	90.00 Hz
Two	408.8000	416.9250	90.00 Hz
Three	406.4000	416.7250	90.00 Hz

The connect tone is not the same as the subaudible tone.

I would imagine that the system is still there and bears monitoring. You never know when the system will become active again.

A reader along the U.S./Canadian border submitted the following regarding Border Patrol and Customs operations in his part of the state. The **Border Patrol in Vermont and Northern New York** as far west as Ogdensburg are dispatched out of Swanton, Vermont. Swanton is known as "640." Swanton covers the border from Ogdensburg to Jackman, Maine. When one goes north of Jackman, the dispatcher at Houlton, Maine, takes over the service. Houlton uses the ID of "620."

Swanton (640) uses five repeater sites. They employ the frequencies of 163.625, 163.675, 163.775, 165.875, and 170.625 MHz. The frequency of 163.625 is the busiest. The input to 163.625 is 162.825 MHz. 170.625 is used in the Derby and Newport areas of Vermont. No Digital scrambling (DES) has ever been heard on any of the BP channels. The Customs frequency of 165.2375 MHz is the only Cus-

toms frequency heard.

While we are discussing Customs, they are converting the New England Sector to Motorola Saber Astro VHF radios. Here are the new **Customs repeater sites in the New England** area (hot off the press):

Location	Output	Input
Madawaska, ME	165.2375	166.4375
Houlton, ME	165.2375	166.4375
Calais, ME	165.2375	166.4375
Jackman, ME	165.2375	166.4375
Bangor, ME	165.2375	166.4375
Litchfield, ME	165.2375	166.4375
Jay Peak, VT	165.2375	166.4375
Boston, MA	165.2375	166.4375

The above are in radio switch position A02.

Blackstrap, ME	165.4875	166.9750
Mt. Ascutney, VT	165.4875	166.9750
Worcester, MA	165.4875	166.9750
Orleans, MA	165.4875	166.9750
Trumbull, CT	165.4875	166.9750

The above are in radio switch position A06.

Cadillac Mtn., ME	169.4500	171.0750
Deerfield, NH	169.4500	171.0750
Mt. Greylock, MA	169.4500	171.0750
Providence, RI	169.4500	171.0750

The above are in radio switch position A08.

Here are the latest frequencies used by **Customs air operations**. These frequencies will be in the AM mode and may be encrypted.

Frequency	Use
132.9500	Aircraft—Victor channel
139.7000	Aircraft—Victor channel
165.7375	Bravo-1-X-Ray (See note below)
234.6000	Blue 5
238.4000	Blue 7
254.2000	Blue 4
260.8000	Unknown designator—heavy S. Fla. use
282.4250	Blue 1
303.8250	Blue 2
336.6000	Blue 3
350.4500	Air to ground and marine units
353.9000	Blue 3
355.9000	Discrete air to ground
361.8000	Blue 9
381.8000	Blue 6
387.8000	Blue 8

NOTE: The frequency of 165.7375 (FM) is confirmed in heavy use in the Southwest United States for air operations.

A reader in the State of Washington sent in the following: **Seattle** DEA office uses channel 6 (418.950 out/416.200 in) for its main operations. The Seattle FBI office uses 167.3875 out/163.8375 input for its downtown repeater. Countywide, the Seattle FBI uses a repeater located on Squak Mountain on 167.2375 out/163.9875 input. The callsign used is KOD220. The U.S. Marshal's office uses a repeater on 164.600 out/162.7875 input for its operations.

Other intercepts include an unknown using the frequency of 166.6375 MHz with traffic in

the Puget Sound area regarding tag checks and prisoner transport details. The frequency of 150.6250 MHz has been monitored with traffic regarding aviation and surveillance of drug smuggling activities in the Tacoma area. This frequency is interesting because it does not fit the normal federal bandplan. The best guess is that it is a National Guard or reserve unit doing drug interdiction activity. This is the portion of the spectrum where you would find them.

The Postal Inspector has been monitored on 414.750 MHz.

The frequency of 417.825 has been monitored with encrypted traffic. This frequency has been monitored in Hawaii also with the same traffic and also "bumper-beeper" sounds. This is not the area where the tracking devices are found. They are in the 170 MHz area. Customs uses this frequency as a "modem link" in the Southwest. It is probably a local DEA operation.

Lastly, I received some more loggings from the **Asheville, North Carolina**, area.

Frequency	Use
164.7000	Unknown use
166.3500	Great Smoky Mountains repeater input - p/l 173.8 Hz
166.3750	Blue Ridge Parkway repeater input - p/l 141.3 Hz
167.1500	Great Smoky Mountains repeater output
167.1750	Blue Ridge Parkway repeater output
168.1250	Forest Service repeater input - output 171.475
168.7250	Forest Service repeater output - input 172.225
171.4750	Pisgah National Forest, p/l 103.5 Hz
171.8750	Simplex—unknown agency
406.1250	Data bursts—repeater out—digital p/l 100 Hz
409.1250	Unknown agency running license tags - digital p/l 723 Hz
412.7250	Data bursts—digital p/l 100 Hz
413.8250	Input to 409.1250

The data bursts are part of an environmental monitoring system known as IFLOWS (Integrated Flood Observance and Warning System). It is a series of remote data collection points that send rain data over a radio link using x.25 packet format. Voice traffic can also be supported on these channels in an emergency.

In Virginia the IFLOWS project is run by the state using frequencies in the 169-172 MHz region. The VHF frequencies are tied into the state police microwave backbone. They eventually end up at the Emergency Operations Center (EOC) in Richmond, Virginia. There are four frequencies in the UHF range. They are:

412.625	Data from state police to NWS and EOC
406.125	Data to state police from NWS and EOC
412.675	Voice from state police to NWS and EOC
406.175	Voice to state police from NWS and EOC

Data from the collection points to the various counties is on 169.5000.

■ Not your basic cable TV

A reader found this in the *Commerce Business Daily* dated June 11, 1997. "The Department of the Treasury (Internal Revenue Service) requires enclosed surveillance systems configured as transformers for mounting on telephone poles. The transmitters shall have an output of two watts and be frequency agile. They shall have an operating temperature range of -20 to +70 degrees C. They shall be remotely controlled and have both tilt and pan capabilities. The cameras will be color and have low light intensifiers on them." I left off the rest of the specs but you get the message.

This and cameras disguised as Cable TV amplifiers are ver-r-y common methods of disguising federal video surveillance equipment. Most people —and this includes the people being watched — do not know enough about what wires and transformers belong on the poles across from their house. To the technically trained and observant — which I hope all of my readers are — things like pole transformers that do not connect to the power lines and cable TV amplifiers that are just hanging by themselves should sound an alarm in your head. Closer examination will reveal a window on the unit with a little lens behind it. This is not found on regular transformers and cable amplifiers.

Most of this equipment transmits regular FM NTSC video signals in standard microwave bands (1.7 to 2.3 GHz, 2.3 to 2.5 GHz, 5.3 GHz, and of course 7/8 GHz). No attempt has been made to scramble these signals. If you have the correct microwave receiver (some European satellite receivers cover this range) or a good spectrum analyzer, you too can watch the suspect go in and out of his residence or business. If you saw the documentary on how the feds caught John Gotti, they used one of these devices on a telephone pole down the street from his social club so they could watch his meetings in the street with his people. The video is quite good.

Television stations have occasionally discovered these signals from their remote news trucks on their remote pickup antennas. Many of the remote pickup frequencies are in the 2 and 7 GHz band. A lot of times bored techs will tune up and down the band to "see" what they can find.

One contributor saw one of these cable TV amplifier surveillance units for sale at the Dayton Hamfest but did not buy it ... The equipment is out there.

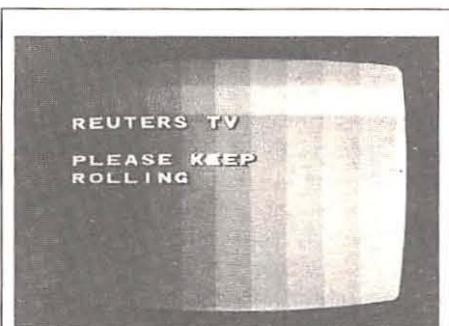
That's it for this month. Let's see you on the FedCom mailer!

The Big Dish Advantage

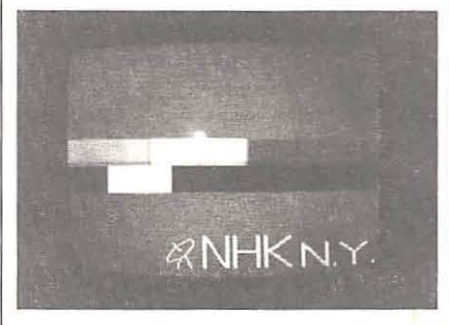
Two years after the wild-fire introduction of direct broadcast satellite (DBS) television, you might have gotten the impression that the big dish universe was history. While it's true that the industry has suffered big losses in subscriber numbers and many manufacturers abandoned big dish satellite TV in favor of the quick money offered by the DBS industry, the technology is very much alive and well.

The reason for the continued success of big dish satellite TV has less to do with home TV viewers and more to do with the television industry as a whole. Those of us still watching big dish satellite are enjoying more and paying less than our friends with the little dishes or on cable. Each year, new audio and video services are launched, and before they end up on your local cable system or the more pricey DBS services, they're seen only on a big dish.

Despite the apparent success of the small dish industry, the really big numbers in television viewing are found in the cable TV industry. While big dish satellite TV claims three million viewers, DBS has four million. Together their seven million viewers are minuscule compared to cable's 65 million subscribers. This is where the real money is.



Reuters TV feeds world news items on C-band as does NHK Tokyo, all in the clear.



Where do you suppose the DBS programmers get their programming? Why, it's down-linked from good old fashioned C-band and re-uplinked to their respective DBS birds. This is why there's more programming available on big dish satellite TV than on any of the DBS satellites. In addition, all the TV networks in North America (the U.S., Canada and Mexico), as well as other nations, use the C and Ku bands to transmit to their affiliates. And, on top of that, many syndication distributors, independent production companies, college sports broadcasters, and governmental agencies use C and Ku to transmit their programs, still in the clear.

■ Networks Galore

Among the biggest users of C and Ku-band technology have been the terrestrial broadcast networks. Whether beaming news and sports back hauls to the network studios or transmitting network programming to affiliates around the country, all networks have used satellite technology to do the job over the last twenty years. They still do.

Viewers in most areas of this country can receive the big broadcast networks ABC, CBS, FOX, NBC, and PBS over the air. Picking up the Warner Bros. Network (WBN) or United Paramount Network (UPN) might be harder. And, unless you live on one of our borders, getting Mexican or Canadian TV is unheard of. You can forget trying to pick up TV from Europe or Asia. Yet, all this programming is available 24 hours a day, in the clear, on a big dish satellite system.

Looking for more variety and specialty programming that you can't find over-the-air or on your local cable system? You can watch The Outdoor Channel, The Computer Televi-

CBS (Newspath) and ABC (NewsOne) have national news feeds on C-band as does FOX News. NBC uses Ku-band. All networks have some feeds in the clear. Look to these feeds for dozens of news stories which may not appear on your local affiliates.



sion Network, Classic Art Showcase, NASA-TV, Arab Network America, America One TV, Network One, at least a dozen shopping channels, and even more religious channels — all on the big dish, all day, in the clear.

■ Sportsman's Paradise

Virtually every major golf tournament, college football and basketball game, NHL hockey game, many college baseball games, professional boxing and wrestling, stock car racing, major tennis tournaments, many professional baseball and football games (despite "universal" scrambling), and soccer from college to pro are found year 'round on C and Ku band satellite TV.

For full coverage of professional baseball and football, you'll have to subscribe to the expensive sports packages (typically \$140 to \$240 per year). Even so, you might be disappointed that your team game is blacked out (unavailable) in your area or that, in the case of baseball, the cable service carries only half the games with the rest being carried by the big networks or independents.

College sports are considerably different, as most big conference teams are carried by their own networks and virtually all in the clear. These networks employ both C and Ku-band with no discernable pattern or rationale. SBS-6, a Ku-band bird, becomes a virtual sports satellite in the fall with as many as 10 individual college football, basketball and hockey games on at once.



Half-hour news programs from France (with English subtitles) as well as BBC and CBC, are transmitted daily on C-band, all in the clear.

■ The Ku Option

Most satellite TV systems are sold and installed with only C-band capability. This is partly because the extra expense and the perception many dealers have of the marginal advantage of Ku-band. In addition, Ku-band reception requires a precise installation with tight dish alignment. Any slop in an installation which could be tolerated on C-band will provide noisy pictures on Ku. Some dealers aren't up to the task. For the real satellite TV DXer, however, Ku-band is a must. Adding Ku-band equipment to the initial installation shouldn't add more than two hundred dollars to the total tab. Retro-fitting an existing C-band installation to include Ku-band could cost more, since the C-band-only feedhorn will not be needed. What will be needed is the extra RG/6 cable to feed the Ku LNB. This, however, is already present on virtually all recent installations.

Since nearly every modern satellite receiver is "Ku-band ready," hooking up and scanning the skies couldn't be easier. Even older receivers can function as Ku-band receivers if they have a video inversion switch, as Ku-band transmissions are sent with the video



Programming from Canada (CBC), Portugal (RTI), Japan (NHK), Emirates Dubai, Germany (Deutsche Welle), are all on 24 hours a day and all in the clear.

signal inverted compared to C-band. Simply adding a high-isolation A-B switch for the two coax feeds and flipping the video inversion switch will allow you to tune most Ku-band birds. Better yet, find an old USCI receiver (G.I. made them in the mid-80's) and operate it as a stand-alone Ku system.

Among the other interesting amenities on Ku-band are SCPC and FM² audio services in addition to the usual subcarriers. There's Chinese programming, TV from Russia, Canada, and at least one PBS channel, again, all in the clear. No special descramblers or fees.

■ But, Wait, There's More

There's C-band, Ku-band, audio services, live sporting events, specialty channels, ethnic oriented programming in native languages, even adult movie channels (eight at last count). With so much in the way of entertainment you'd imagine that big dish satellite TV gear would sell for premium bucks.



Channels you didn't even know existed, such as FOX Kids Network, Classic Arts Showcase, Z music, Computer Television Network are up all day and in the clear.

Not so. Excess equipment from going-out-of-business manufacturers and distributors are selling for rock bottom prices. Brand new in-the-box receivers are selling for as little as \$200. With lots of folks caught up in DBS hysteria, getting a complete used system for \$200 is a snap. Some folks might even pay you to take the big dish away.

With the introduction of General Instrument's 4DTV, big dish owners will be prepared for the next technological big dish revolution: digital transmissions in the Digicipher II mode. You'll be able to add many more years to your viewing pleasure thanks to 4DTV's capability to receive analog, Videocipher II, Digicipher II, and Digicipher II encrypted signals. This is what makes satellite TV of the past the satellite TV of the future. And, if you're interested in news, sports, music, arts,

international programming, adult fare, and wild feeds check out the big dish advantage.

■ Transponder Notes

As you've doubtless heard by now, Mr. Murdoch had a falling out with Mr. Dish and instead of teaming up with Echostar, the Media Baron from Down Under has set his sights on the more friendly Primestar service. Friendly because it is seen not as a threat to cable interests (as DISH was seen) and because the combined force of Murdoch and the Primestar Partners (a consortium of cable giants) will be most threatening to DSS, DISH, and what's left of Alphastar.

There's reason for those services to be concerned. Already suffering financially from the inter-DBS price wars, fighting a protracted war against each other and big cable (fueled by Murdoch's deep pockets) may prove debilitating.

In the "Where-Are-They-Now?" Dept: Following the loss of Telstar 401 last January and Spacenet 2 falling into disuse several months ago, it's not been easy tracking down the whereabouts of a number of the missing inhabitants. South Carolina Public Television was on the Ku side of 401 and is rumored to be on Orion in a Digicipher II format. The VOA SCPC signals on Spacenet 2 have reportedly gone digital on T402.

Only Radio Martí remains in analog SCPC on T402. BBC breakfast news is still seen occasionally on G9, 1 at 3:00 am ET. BBC World News has been seen at Noon ET on various satellites. It's on every day at 11:00 am ET on CBC's Newsworld (Anik E2, 6) with Canadian commercials inserted.

**KEEP YOUR C-BAND SYSTEM
RUNNING STRONG!**

Free Buyer's Guide

BEST VALUES ON...

- Receivers, including 4DTV
- Dish Movers & LNBs, all kinds
- Tune-up Kits, Tools & Parts
- Skypac™ Programming
- Toll Free Technical Help

1050 Frontier Dr.
Fergus Falls, MN 56537

Fax: 218-739-4879
Int'l: 218-739-5231

800-334-6455
www.skyvision.com

Skyvision

WiNRADiO's RF Spectrum Scope

Noted science fiction author Ray Bradbury wrote a classic short story many years ago called, *Something Wicked This Way Comes*. Drats! I wanted to use that title because do I ever have something "wicked" for you! Only there's nothing sinister about mine: it's just a ray of brilliance.

Have you ever lusted for a spectrum analyzer (SA)? I have. But at price tags of \$5000 to \$60,000, it never got beyond the salivating stage ... nor do you get that much of an SA for five kilobucks, either. But that's commercial stuff. There are some interesting alternatives to spectrum analyzers available to hobbyists at hobbyist prices. One of which I'm aware dates back to the 70's: a "roll your own" series of kits from Science Workshop called the "Poor Man's Spectrum Analyzer." For about \$300 (and you supplied your own oscilloscope), you could concoct a kludge that indeed monitored the RF spectrum with a visual display. I haven't heard anything out of Science Workshop in recent times, though.

Al Helfrick (K2BLA), and A & A Engineering took the concept a lot farther with their "450 MHz Spectrum Analyzer," as featured in the Nov-1985 issue of *QST* magazine. It's still available today as a kit, less cabinet, hardware, and oscilloscope, for under \$300.

More recently, Grove Enterprises introduced ready-to-go spectral viewing to the hobbyist with their SDU 100 Spectrum Display Unit (not currently being manufactured). Priced at under \$500 and virtually "turn-key" operable, the SDU-100 is useful with selected receivers, including the Icom R7000, R9000, and R7100, but you have to supply the receiver and a monochrome monitor, or purchase a separate monitor.

Icom, of course, includes a spectral display monitor in their high-end R9000 and in some of their high end ham transceivers.

The point is that viewing more than a few kHz of RF spectrum at a time has always been an expensive proposition. Most of us just resort to the "armstrong spectral tuner" (use your arm and hand to spin the tuning dials and flip the bandswitches of a receiver). None of these hobby-SA's are computer-based.

The paradigm is about to shift — indeed, something wicked this way comes! Enter

Rosetta Laboratories, WiNRADiO (see *MT* Sept & Oct-1996), and their latest upgrade to the WiNRADiO software (v2.04 at this writing), where an RF Spectrum Scope has been included at no added cost. If you already own a WiNRADiO, you can download the latest software for free at the Web sites given below.

Version 2.04 offers refinements and added features to the regular user interface and control program; but the bombshell whopper is the RF Spectrum Scope, basically a spectrum analyzer feature previously found only on very expensive radios! See Fig-1 where I set up a quick spectrum scan in 5 kHz steps between 158-159 MHz. Fig-2 is a subsequent sweep in 2 kHz steps of a narrower part of that spectrum, 157.9-158.3 MHz. The large signal at 158.100 MHz is (what else?) a pager. Voice signals appear in Fig-1 at 158.52 MHz and in Fig-2 at 157.94, 158.03, and 158.26 MHz. The three-peak blip in Fig-1 at 158.8 MHz is probably a pair of voice signals on adjacent channels.

receiver scans the band. Any signal within that window produces a response in the trace.

Different trace colors distinguish the maximum, minimum, previous, and current sweeps. This is especially wicked for identifying 2-way radios that key and unkey all the time, in contrast to broadcast and continuous carrier signals. Pagers are wide, multi-peaked displays where 2-way voice signals appear as narrower "blips."

WiNRADiO's RF Spectrum Scope can be set for a single sweep or continuous sweeping with the receiver muted or blaring, as you choose. Sweeps are set in one of two ways: start freq-stop freq (end to end), or center frequency and bandwidth. Sweeps can be as narrow as a few kHz to a maximum of 100 MHz. Wicked!

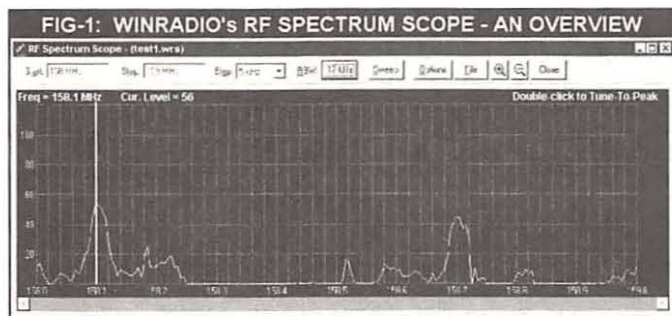
Utterly delightful, the spectrum screen can be saved to a very small file and redisplayed later for analysis and tuning, or be captured as a graphic image (photograph). Hundreds of sweeps can be saved in a very small amount of disk space. The ones pictured here require around 1250 bytes.

The RF Spectrum Scope has a Zoom-In / Zoom-Out feature to make the spectral display appear with more or less horizontal detail. The "Scope" shows frequency and relative S-Meter numbers (0 to 100) of the trace at any point touched (moused) by the cursor.

Great boogly woogly! What else can be said? The RF Spectrum Scope feature of WiNRADiO really works,

and it's included in the under-\$600 total price of the radio (computer not included, of course). Not only does it work, but also you can do some fairly serious fingerprinting and identification of signals in the spectral display with a little experience under your belt.

In short, WiNRADiO's RF Spectrum Scope



One of the wickedest things about the new RF Spectrum Scope is the capability to position the cursor on any "blip" or spot in the trace and instantly, WiNRADiO tunes to that frequency! Bzzzaaaap! That quick! My WiNRADiO receiver is tuned to 158.100 MHz in Fig-1 and 158.104 MHz in Fig-2.

The RF Spectrum Scope has ten selectable spectrum scan steps: 1, 2, 5, 10, 12.5, 20, 25, 30, 50, and 100 kHz; two resolution bandwidths, 6 and 17 kHz; and a slew of options shown in Fig-3. Resolution bandwidth is the width of the frequency "window" with which the

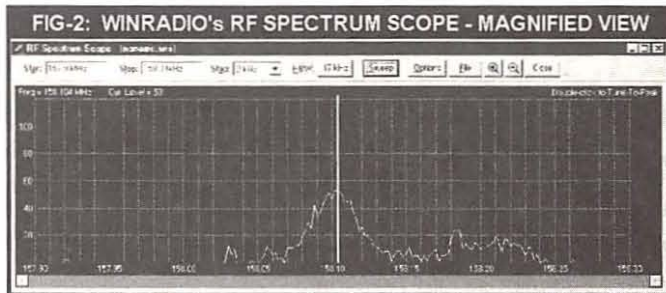
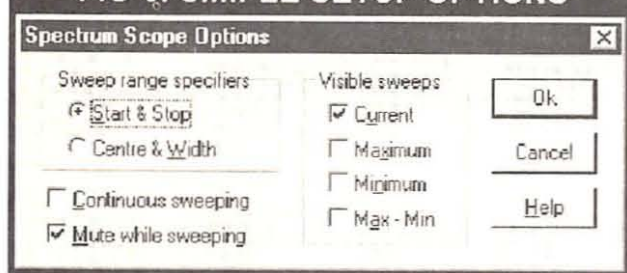


FIG-3: SIMPLE SETUP OPTIONS



is likely the best yet amateur and hobbyist approach to spectrum analysis. And, it's free. (Huh?) Well, the alternatives require a six- or seven figure budget for a "real" SA, or assume that you already have a four-figure receiver and plenty of cash for the peripherals. Of course, if you don't have a computer, then you can't use WiNRADiO. If you have a PC-386/ higher, but no DC-to-daylight receiver, then something under \$600 gets both a quality 500 kHz-1.3 GHz receiver and a very useful spectrum scope. If you have an earlier WiNRADiO, then you can get the highly enhanced software upgrade for free! How else you can come close to spectrum viewing for under \$600 — short of a benevolent uncle, maybe?

By the way, it is not widely known, but WiNRADiO can work under MS-DOS in 8-bit slots of 286 and higher PC's, so if you're mired in computational dark ages, you might still be able to play computer controlled radio. The best operating environments, however, include 16-bit slots in 386 PC's or higher, operating under Windows 3.1x, Windows 95, or Windows NT 3.5/up.

■ What's New in WiNRADiO V2.04

Version 2.04 of the WiNRADiO software has significant improvements over the original, including:

1. Above described RF Spectrum Scope
2. Step size resolution now 100 Hz, adjustable over a range of 100 Hz to 10 MHz

3. Extra scanning Pause mode in Scanner Setup

4. Enhanced range scanning (stored variables now include mode and squelch settings)

5. Memory group numbers are now shown in Memory viewer

6. Squelch is now joined with scanning sensitivity (but can be separated in General Options)

7. Signal Strength values (0-100) now shown in the bar-graph Signal Strength display

8. Long file names are now supported for Windows 95 and NT

9. "Always On Top" feature

10. "Hide Title Bar" feature

11. Drivers for Win3.1x, Win95, and Win NT 3.50/up are now supplied as part of the install program

12. I/O address setup was added to the Windows Control Panel for easier setup

These new functions are self-explanatory, but the WiNRADiO on-line help is excellent.

■ More Information

The latest information and software updates for WiNRADiO are available at the US Web site at <http://www.winradio.com> and at the Australia site: <http://www.winradio.net.au>. These sites also contain programming information (both 16 and 32 bit) for those who want to write their own software for the WiNRADiO receiver (the information supplied in the manual is superseded). If you don't have a WiNRADiO, you can still download the v2.04 software and run it in a demo mode.

■ Please Note

Please note my new e-mail address and 24-hr direct connection to the Internet. Also note that my BBS closed for good on May 31,

1997. It is being replaced by bigger and better Web and FTP sites.

E-mail: bccheek@san.rr.com
 WWW: <http://ourworld.compuserve.com/homepages/bccheek>
 FTP: <ftp://ftp.cts.com/pub/bccheek> or <ftp://204.210.20.47>
 FAX: (619) 578-9247 anytime
 Postal: PO Box 262478; San Diego, CA 92196-2478

Award Winning Antenna



Winner of the 94 WRTH award for the most innovative design. High performance MW Loop tunes 530 to 1700 kHz with features unlike any other antenna!

Kiwa Electronics

612 South 14th Ave., Yakima WA 98902

509-453-KIWA or 1-800-398-1146
kiwa@wolfe.net (Internet/full catalog)
<http://www.wolfe.net/~kiwa>

GRUNDIG YB-400



"The compact model most preferred by our panelists for listening to major worldband stations... audio quality is tops within its size class."

Passport to Worldband Radio

Here's everything you want at a price you can afford. The Grundig YB-400 covers LW, MW, FM and all of SW. An illuminated LCD reads to 1 kHz on SW. Enjoy smooth SSB with fine tuning knob. Tune your favorite stations instantly with keypad entry or 40 memories. Other features include: dual digital clock-timer with snooze and dial lock. Switches for: Wide-Narrow, Local-DX and Hi-Low Tone. Supplied with six AA cells, carry case, wind-up antenna, manual and Grundig Wave Guide. #0040 \$169.95 (+\$6)

Universal has a limited number of like-new **Factory Reconditioned YB-400s**. All accessories and same one year limited warranty. #1704 \$149.95 (+\$6)

Order now and get a **FREE radio stand** and a **FREE copy of DX Tips For Beginners** with your YB-400!



Universal Radio
 6830 Americana Pkwy.
 Reynoldsburg, OH 43068

♦ Orders: 800 431-3939
 ♦ Info: 614 866-4267
 ♦ FAX: 614 866-2339
www.universal-radio.com

Quality Communications Equipment Since 1942

FIG-4: IMPROVED WINRADIO



Radio Rafting and Web Surfing

Wow! You people have been keeping my E-mail and mailman busy with web sites and subjects that are interesting, and potentially quite useful. We'll take a look at these a bit later.

First I want to share with you a new communication mode decoding program, **Radioraft**. This decoder is capable of ten ARQ modes, eight FEC modes and more. The price for the "Lite" version, which only includes six of the most popular modes, is free and immediately downloadable from the Internet. Sound good? Read on.

Radio Rafting Basics

The modes which Radioraft decodes are shown in Figure 1, which is a pull down menu from the program's main screen. Version 2.0 decodes various forms of Baudot, ARQ, FEC, Packet, SITOR, Autospec, Spread, and Morse. Its computer requirements are modest by today's standards. Its minimum requirements are a 386 with one comms (serial) port and a VGA card. The program runs under DOS 3.2 or newer, not Windows.

You can build and use the audio-to-computer interface which is described in Radioraft's Help file. If you have an interface which works with Hamcomm or JVFX it will work with Radioraft. I used an interface I built quite a number of years ago, which is designed around the ancient (and cheap) 741 operational amplifier. Audio from the receiver is connected to the input. The output of the interface connects to the computer's serial, or comms port. You can use either comms port 1

or 2. Although the author is working on the use of other ports for the next version, Ports 3 and 4 are not supported in version 2.0.

The program originates in France. But the comprehensive Help file is available in a number of languages, including, of course, English.

Starting Down the Decoding River

The Internet file, RAFT201.EXE, is about 250K bytes long and downloads in a few minutes using a 28.8 bps modem. Running this self-extracting file eventually produces a subdirectory RADIORAF containing the main program and instructions. A sub-subdirectory is also created called MASTER.

When you first run the program you will be asked a number of setup questions. All but one can be changed from within the program. The one that cannot be changed from the program asks if you have a coded number which allows you to use the full version, not the limited feature LITE version. This full version unlock number is given to the user by the author once a fee is paid. Installation could not be simpler or easier. The total disk space required by the program is small at less than 500K.

Floating a Raft

The input signal level indicator is located on the top right hand side of the screen. It appears as horizontal lines. The length of the right line indicates the quality of the input signal. The left line shows the error rate of the signal. In both cases, the longer the lines the

better. I found this to be a little tricky to set up. I suggest you spend some time with a strong, easily copied RTTY weather station in order to determine the best settings. This depends a lot on your interface, so experiment. It will be a small amount of time well spent.

Tuning your signal to the audio frequency that the program is "listening" for is easily done using the Frequency Meter, which is displayed when key F8 is pressed. This is shown as the third line down in Figure 2. A wide bar will appear representing the input signal's frequency. Tune your receiver so that the wide bar is positioned at the + mark on this line and you will be set to start decoding.

The operation of the program can be controlled by either the keyboard or the mouse, interchangeable at any time. Figure 2 shows the main screen. A meteo (weather) RTTY station decode is shown. The middle line at the top of the screen, starting at the left with the word File, is the command line. Going from right to left, we first have a very complete Help file. Next we have the Setting menu which contains lots of important selections.

After you select the type of interface you want to use, a second very important menu appears. This is the screen in which you choose the audio input parameters, including the center frequency to which the incoming signal must be tuned. One choice is Signal Tracking, designed to move the input of the decoder to the frequency of the input. We'll talk more about how well this feature performs later. The comm port is also designated from this menu.

Options menu is next with a double click option of "auto-shift-reverse" select. When selected, the program will attempt to automatically determine which is the mark and which is the space tone.

Auto Everything

Again looking at Figure 2, the next two control menus are pretty nifty. These control the setting for mode and speed via pull down menus. It's all here for the taking. But notice, the word "scan" appears in the front of these labels. If we now click on the "scan" in front of the mode, both the mode and the scan speed go into automatic mode trying to obtain a valid match to the input signal. This is Radioraft's automatic decoding mode which lets the computer identify the type of input signal coding.

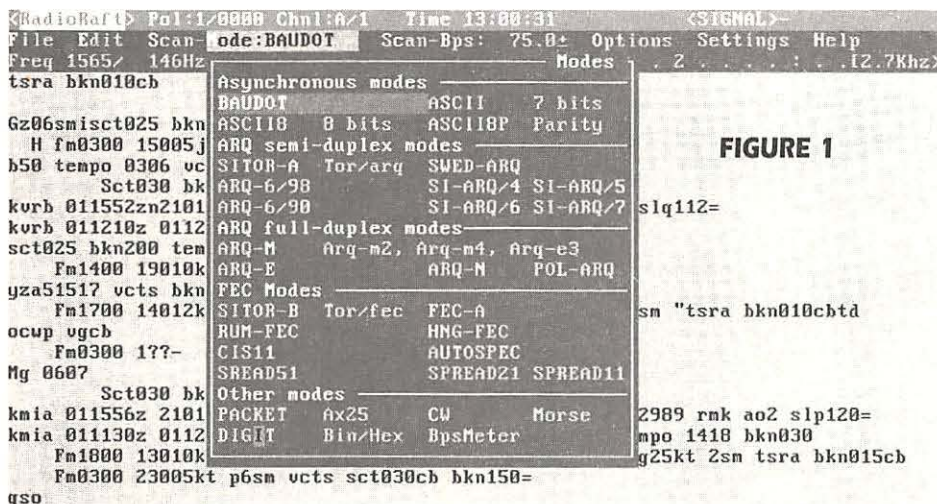


FIGURE 1

```

File Edit can-mode:BAUDOT Scan-Bps: 75.0 Options Settings Help
Freq 1564/ 1675Hz <0.31> . . . . . 1 . . . . . 2 . . . . . 12.7KHz>
tsra bkn010cb

```

```

Gz06smisc025 bkn060 prob40 2303 2sm tsra bkn020cb
H fm0300 15005j
b50 tempo 0306 vcts bkn025cb becng 0607
Sct030 bkn250=
kurb 011552zn21011kn023 bkn090 ovc200 29/23 a2986 rnk slq112=
kurb 011210z 011212 12007k
sct025 bkn200 tempo 1214 bkn025
Fm1400 19010kt p6sm
yza51517 vcts bkn015cb
Fm1700 14012kt p6sm sct030 tempo 1723 vrb20g40kt 1sm "tsra bkn010cbtd
ocup vgcb
Fm0300 1??-
Mg 0607
Sct030 bkn250=
knia 011556z 21010kt 10sm sct034 sct150 ovc250 29/22 a2989 rnk ao2 slp120=
knia 011130z 011212 12006kt p6sm vcsb sct030 bkn150 tempo 1410 bkn030
Fm1800 13010kt p6sm sct030 bkn100 tempo 2103 vrb15g25kt 2sm tsra bkn015cb
Fm0300 23005kt p6sm vcts sct030cb bkn150=
qso

```

FIGURE 2

When the program has grabbed onto a match, three things will occur. The various mode types and speeds will stop rolling by and only one of each will be constantly displayed. The top left "<RadioRaft>" symbol will change to scrolling decoded data. And finally, this data will appear in the center part of the screen.

Once the data is coming through cleanly, a second click on "scan" stabilizes the process and returns the decoder to the manual mode. If you click on the "scan" in front of the speed (bps - bits per second) the mode will remain in the manual mode while the speed automatically looks for a match: a thoughtful operating touch.

Does It Work?

The answer to this question comes in parts. Life is never simple. I like the whole feel of the program. It's very easy to use without ever looking at instructions. We have only covered a number of key features: Radioraft has many more.

In high to medium signal strength conditions, using my homebuilt decoder, Radioraft performed well — *once the proper signal level was found*. Figure 2 is live copy, with a fair amount of signal fading.

However, my decoder/interface system did not like weak signals in its automatic mode. It could not make up its mind. I manually tried each combination of mode and speed and had better results.

Using the Signal Tracking feature mentioned above did not seem to produce the proper results. You could see the program hunt for the input signal when it was not at the + mark on the Frequency Meter. Two <> symbols automatically move along the bar until they surround the input signal bar, a nice bit of programming. But the process takes awhile, and I found that the signal had to be very, very strong before it would decode anything using

Signal Tracking. Nice idea; more work needed.

Don't Abandon the Raft!

I believe that the weak signal problem lies more with the ultra simple interface and less with the program. Radioraft LITE is a lot of program for free, and the full version is a real bargain at \$28. Radioraft is available from: Francois Guillet, 17 rue Michel Delalande, F-44800 St-Herblain, France. His E-mail is: F6FLT@TheOffice.net. Check out his Web site and download the LITE version from Web site: <http://yourworld.compuserve.com/homepages/F6FLT/>. Tell him you saw it in MT's Computers & Radios column.

Bits & Bytes

The computer industry is a very interesting one. Where else could a company that has lost over \$25 million be bought for \$400 million? That was just the case with the WebTV company, which was a loser until Bill Gates decided he needed a TV media/Internet provider arm to Microsoft. The Sony and Magnavox Web TV boxes continue to fall in price. Currently they are both at \$250 ... and falling. The public has not yet embraced the Internet in the living room concept. Perhaps it is the price? Where's the magic dollar number? Place your bets. But remember, home DSS systems did not sell big until they hit the \$199 level! Stay tuned... I mean, stay connected.

The year 2000 brings with it the problem of having a two digit date that cannot be used arithmetically. You can't do much with "00." I spoke with an inventor recently who told me vast sums of money are being spent by the financial community to find a solution. Some government agencies are warning of "major shutdown problems." The clock is ticking... Maryanne Kehoe sent us an article titled, "Thousands of neglected ... outdated sites litter the Internet." Welcome to media blitz

and hype. Few of us check the validity of information anymore. If a person on TV or radio says it's so, it must be. And if we see it written on the Internet that proves... that proves... nothing.

More Mining Gold

First, let me set the record straight. I wrongly reported the World Utility News site in a previous column. This excellent site is at <http://www.gem.net/~berri/wun>. My thanks to Rick Baker for this corrected info.

Lisa Herder tells me that she has thrown away her phone book and CD roms of phone numbers. Instead she uses <http://www.bigyellow.com> to find anybody in the USA. It works. She found me.

Another orbit prediction and space site was sent in by KF4CYB. Try www.ghg.net/tbraithw/mirtop.html.

Thanks to everyone who E-mailed and wrote to me. I'll pass on any interesting sites or stories that you send. Let me know of any topics that you would like to see us cover and we'll give them a try. Keep those web sites coming. Till next time, I wish you smooth rafting in cool, calm waters.

**FREE
SAMPLE
COPY!**

ANTIQUE RADIO CLASSIFIED

*Antique Radio's Largest-Circulation
Monthly Magazine*

Articles - Classifieds - Ads for Parts & Services
Also: Early TV, Ham Equip., Books,
Telegraph, 40's & 50's Radios & more...

Free 20-word ad each month. Don't miss out!

1-Year: \$36.95 (\$53.95 by 1st Class)
6-Month Trial - \$18.95. Foreign - Write.

A.R.C., P.O. Box 802-P11, Carlisle, MA 01741
Phone: (508) 371-0512; Fax: (508) 371-7129
Web: www.antiqueradio.com

The NXL-250A: PICKS UP STATIONS LIKE AN OUTDOOR ANTENNA AND SOLVES YOUR NOISE PROBLEMS TOO!

The NXL-250A uses a special shielded noise-cancelling loop which cuts local noise interference such as power-line buzz, computer and TV hash, etc. Its internal high-gain amplifier and sharp tuning combine with the loop to give you higher signal-pulling sensitivity than any other indoor active antenna. Covers 540 kHz to 30 MHz. With the high-sensitivity 20-in. loop, it's only \$127.95, or with the compact 12-in. loop, it's only \$117.90, ppd! (Specify radio model for proper output adapter.) Avail. options: Automatic internal antenna switch \$20.00. High sens. MW loop (500-1700 kHz) \$84.95. AC adapter \$9.95. Order an NXL-250A today! To get our catalog, send a 32 cent stamp.

WORLD COM TECHNOLOGY

1118 Raymond Ave., Ft. Pierce, FL 34950
Call (561) 466-4640

Culture and The Arts

In summer, the lively arts seem to get...well...livelier! Outdoor venues, that were unusable in colder weather, join with the year-round indoor *places des arts* to provide a virtual cornucopia of options. In Europe, music and arts festivals like the Proms in England, the Edinburgh International in Scotland, and the Salzburg Festival in Austria are held across the continent. You can travel there (vicariously, of course) through the magic of your shortwave radio! International broadcasters provide regular coverage of these events—everything from a front row seat to performances in a few occasions to regular reports from the festivals.

Much of this coverage is broadcast direct from the home country via regular programs devoted exclusively to the arts. Stations know that one of the prime motivations for listeners tuning in to their broadcasts is the opportunity to learn something about the culture of the nation in question, so a significant portion of nearly every station's schedule is devoted one way or another to coverage of the arts in the country originating the broadcast.

Here is a list of some well-produced arts programs on shortwave. While the term "culture" can be interpreted in a more expansive sense to also include the history and traditions of a people or place, we are concentrating here on programs which report on or otherwise highlight major national, regional, and international cultural and artistic events and performers. Smaller stations that might not offer specialized arts programs often provide coverage through daily magazine style programs that report on a range of domestic topics, including the arts.

Please consult *MT's* Shortwave Guide for frequencies and transmission target areas of the broadcasts listed, as well as for the broadcast times, frequencies, and target areas of stations from countries of interest not listed in this article. For example, Radio Austria International and Swiss Radio International do not feature programs specifically dedicated to coverage of the arts. Nonetheless, the program *Report from Austria* in the case of the former, and *Newsnet* and *Rendezvous with Switzerland* in the case of the latter, regularly provide at a minimum topical coverage of cultural current events within each nation.

Please remember that dates and times are in UTC. An * denotes that a program broadcast

time will likely move one hour later UTC when clocks are shifted to standard time in the fall. Programs and times were checked for correctness at press time, but stations may have made changes in the interim.

■ All India Radio

In India, the cinema is king. Motion pictures are a passion with the Indian public and the orientation of AIR's cultural programming reflects this fact.

Film Story offers a detailed, descriptive summary of a current popular movie. It can be heard on the third Sunday of each month at 1350, 1830, and 2120; also on the third Monday of each month at 2330. *Indian Cinema* is a monthly report on the Indian motion picture industry broadcast on the second Monday of the month at 0005 and the second Saturday of the month at 1030, 1425, 1910, and 2215.

■ BBC World Service

Meridian is the BBC's flagship program devoted to coverage of the arts. *Meridian* takes a wider view than most shortwave arts programs, regularly extending itself beyond the British Isles to provide a more global perspective on artistic events, personalities, and topics. The program is presented four times weekly in four different forms. *Meridian Feature* examines, in documentary form, a topic drawn from the arts. *Meridian Live* takes a weekly look at the arts around the world. *Meridian On Screen* discusses and reports on the international cinema. And *Meridian Books* covers the international literary scene. The broadcast schedule is somewhat convoluted:

Meridian Feature: Americas/Europe stream Saturdays at 0630 and 2130 and Mondays at 0230; Africa stream Saturdays at 1930 and Tuesdays at 1030; Asia stream Sunday at 0630 and Monday at 0915 and 1530 (to South Asia only) and 1130 (to East Asia only).

Meridian Live: Americas/Europe stream Tuesdays at 2130 and Wednesdays at 0230 and 0730; Africa stream Tuesday at 2130; Asia stream Wednesdays at 0915 (to South Asia only), 1130 (to East Asia only) and Thursdays at 0630.

Meridian On Screen: Americas/Europe stream Tuesdays at 0230 and 1030 and Wednesdays at 2130; Africa stream Mondays at 1930 and Wednesdays at 1030; Asia stream Tuesdays at 0915, Wednesdays at 0630 and 1530

(all to South Asia only), Tuesdays at 1130 (to East Asia only) and Thursdays at 1930.

Meridian Books: Americas/Europe stream Thursdays at 0230, 0630 and 2130; Africa stream Thursdays at 1030 and 2130; Asia stream Fridays at 0915 and 1530 (both to South Asia only), 1130 (to East Asia only) and Saturdays at 0630.

Apart from changing feature programs and series on the arts that the BBC broadcasts from time to time, *Spotlight* is a regular program that listens in to conversations among theatre directors, writers, actors, and critics about works which matter to them and why. *Spotlight* is a five minute program airing Fridays at 1740 and Saturdays at 0155 in the Americas/Europe stream, Thursdays at 0925 in the Africa stream, and Fridays at 1525 in the Asia stream.

Live and taped broadcasts from the *103rd Henry Wood Promenade Concerts*, which began in July, continue into August. Via the Americas/Europe stream, tune in Sundays at 1401 and Mondays at 0815. The Africa stream carries the concerts each Sunday at 1401 and Mondays at 2115. Listeners can hear these concerts via the Asia stream Sundays at 1401 and 2115 and Mondays at 0815.

■ Channel Africa

Artist of the Week profiles a prominent African artist and may be heard each Thursday at 0438. *Arts Profile* features interviews with South African performers and is broadcast on Saturdays at 1637.

■ Deutsche Welle

Cultural events in Germany are highlighted every week (except the first week of the month), in *Arts on the Air* which goes out on Sundays at 0915, 1115, 1615, 1915, and 2015 and Mondays at 0115, 0315, and 0515.

■ HCJB

On Line, a production of HCJB's European arm, is a magazine style program that examines European popular culture. It is broadcast at 0730 and 1000 on Fridays and 0200 on Saturdays.

■ Polish Radio Warsaw

Focus presents the arts in Poland and is broadcast Thursdays at 2000*, Fridays at 1730*, and Saturdays at 1230*.

■ Radio Australia

At the time this article was submitted for deadline, much was still unknown about the full extent of schedule changes made necessary by deep cuts to this station's budget. Speculation has centered around increased reliance by *Radio Australia* on the ABC domestic network for programming and abandonment of the existing 24 hour English service in favor of an 18 hour schedule. Consequently, information presented here may have changed drastically by the time you read this.

Arts Australia, a cultural current events magazine hosted by Sian Perry, airs Tuesdays at 0031, 0931, 1431 and 2131 (2031 when clocks are shifted in October).

■ Radio Budapest

Hungary's broadcaster presents a bi-monthly *Cultural Review*, which surveys Hungarian cultural current events. The problem with Radio Budapest is that it shifts its programming schedules almost on a monthly basis. At deadline, *Cultural Review* was scheduled on the first and third Mondays of the month during the 2100 transmission and the first and third Tuesdays of the month in the 0230 broadcast. (Radio Budapest does, however, offer a monthly program guide free of charge that arrives within the first few days of each month and has an Internet site that has timely information about its programming. Mailing address: H-1800 Brody Sandor u. 5-7, Budapest. e-mail site: <ANGOLI@kaf.radio.hu>. Internet: <www.eunet.hu/radio>.)

■ Radio Canada International



Arts in Canada, which takes listeners to various Canadian cultural events and provides interviews with a wide range of Canadian artists, is broadcast Sundays at 2008* and Mondays at 0108*.

■ Radio Exterior de Espana (Spanish National Radio)

Arts in Spain, which reports on national and regional cultural events, goes out at 2240* on Fridays and at 0039, 0139, and 0539 on Saturdays. *Entertainment in Spain* reports on Spanish theatre, cinema, and music every Monday at 2040* and Tuesday at 0039, 0139, and 0539.

■ Radio France Internationale

Arts in France is a weekly cultural report airing Mondays at about 1237, 1437, and 1637 and Tuesdays at approximately 1715. *Film Reel* concentrates on the unique and proud French cinema and is broadcast Sundays at approximately 1715, Thursdays at about 1447,

and Fridays at about 1637.

■ Radio Netherlands

Mirror Images is an award winning and lively mix of interviews, reports, music, and readings with regular contributions from arts correspondents from around Europe and the world. David Swatling hosts this program which transmits Tuesdays at 0753, 0953, 1153*, 1353, 1753, and 1953, and Wednesdays at 0053, 0253, and 0453.

■ Radio Prague

The Arts is a weekly report on Czech cultural events and is broadcast on Wednesdays at approximately 0340, 0710*, 0910*, 1040*, 1310*, 1610*, 1710*, 2010*, 2140, and 2240; Thursdays at approximately 0010, 0110, and 0310.

■ Radio Romania International

Programs devoted to Romanian cultural and artistic life are heard twice a week.

Cultural Survey airs on Fridays during the second half hour of the 0645, 1430, 1900, 2100, and 2300 transmissions and Saturdays in the 0200 and 0400 broadcasts.

World of Culture goes out on Saturdays during the 0530, 0645, 1430, 1730, 1900, 2100, and 2300 blocks and Sundays in the 0200 and 0400 broadcasts.

■ Radio Slovakia International

Cultural Happenings looks at cultural events in Slovakia on Mondays at 0840, 1640*, and 1840* and Tuesdays at 0110.

■ Radio Singapore International

The visual and performing arts in Singapore are the focus of *Arts Arena* which goes out each Monday and Thursday at 1115, Saturday at 1250, and Sunday at 1340.

■ Radio Sweden

Spectrum highlights the arts in Sweden twice monthly on the first and third Saturdays of each month at 1130*, 1230*, 1330*, 1730, 1930*, 2030*, and 2130*; and the first and third Sundays of the month at 0130, 0230, and 0330.

■ Radio Ukraine International

Every Friday at 1210* and 2110* and Saturday at 0010* and 0310*, Radio Ukraine International presents *Roots*, a 45 minute magazine variety program devoted to culture and the arts in the Ukraine.

■ Radio Vlaanderen International

Around the Arts is a brief, but twice weekly,

report on the arts scene in Belgium. It is broadcast each Monday and Thursday at approximately 0643*, 0913*, and 1313* and each Wednesday and Friday at approximately 1813*, 2113*, and 2343*.

■ Voice of America

Critic's Choice is a weekly program looking at the performing arts in the USA. It goes out each Sunday at 1010 and 1310 to East Asia only and at 1710 to East and South Asia and Europe, North Africa, and the Middle East.

■ Voice of Russia

Russian culture and that of its constituent nationalities are consistently on display in several Voice of Russia feature programs, which generally air during the second half hour of each hour's transmission. The focus of these programs is rather wide, however, so every installment or report within them may not necessarily address itself to the arts or an artistic event or performer. Check the following programs:

Kaleidoscope on Sundays at 1432*, Mondays at 1032* and 1732*, Tuesdays at 0232* and 1332*, Thursdays at 0832* and 1332*, Fridays at 0332*, and Saturdays at 2032*.

This is Russia is a program that examines many features of Russian life, including the arts. It may be heard on Sundays at 0532*, 1132*, 1732*, and 2132*; Mondays at 0532* and 1632*; Tuesdays at 0032*, 0632*, 1232*, and 1932*; Wednesdays at 0532*, 0932*, and 1632*; Thursdays at 0032*, 0632*, 1232*, and 1932*; Fridays at 0532* and 0932*; and Saturdays at 0032*, 0632*, 1832*, and 2332*.

VOR also carries a daily feature block of changeable programming which often will include a program or documentary on the arts. These features are carried Monday through Friday at 1532* and 1832*, and Tuesday through Saturday at 0332* and 1032*.

■ Voice of Turkey

Cultural current events in Turkey are highlighted every Friday at 2215* and Saturday at 0315* on *Turkish Album*. The 20 minute program features reports on cultural happenings around Turkey interspersed with contemporary and traditional Turkish music.

■ Music Update

A few schedules have changed since the May feature article on music programming: *Deutsche Welle* has dropped the program *Jazz!* and replaced *Hallo Africa* with *Good Morning Africa*, retiming it for Monday to Friday at 0432 and 0632. *HCJB* has added a broadcast time for *Musica del Ecuador* (2100 Mondays) and retimed the Friday 0800 broadcast to 0830 and the Saturday 0830 broadcast to 0900.

Getting on Track

Larry VanHorn
trunkcracker@grove.net

Welcome to the first *Tracking the Trunks* column, dedicated to sharing tips and hints, trunk frequencies, and trunking system subtleties. Initially we will of course focus on the first scanner of this type—the new Uniden BC-235XLT Trunk Tracker—though other models will follow.

If you have one of these new radios, you have no doubt have experienced the same exhilaration we have in once again being able to follow public safety communications. The BC-235 is a great radio and unarguably the biggest technology development in scanning in over two decades. A big "thank you" to Uniden and the entire "235 development team for making scanning fun again."

Now let's dive right into some tips provided by early TrunkTracker users via the Grove *Trunkcom* internet newsgroup.

Restoring Talk Group Lockouts

Walter Wallenborn passes along the following tip on how to remove a talk group from the lockout list on your "235 so you can listen to them again."

1. Press and hold the <L/O> button until it beeps.
2. Scroll through the list with the <Limit> (down arrow) and the <Hold> (up arrow) buttons.
3. When you get to one you want to listen to, press <L/O> to put it back in the scan list in both scan and search.
4. Press <Search> button to get out of the review mode.

Frequency Programming Hint

Bill Cherepy in Grayson, Georgia, passes along this tip for programming frequencies into the "235. "If the system you listen to is like my county and always uses the same three or four frequencies as the data channel, do what I did. I programmed those frequencies in the first channels in the bank. That way, when you go to trunking mode it finds the control channel quicker than if it has to scan through 15 or so frequencies."

Monitoring Phone Patches on the Trunk

"If your county uses a dedicated frequency for phone patches you can enter it in the 20th position of the bank for the system you're monitoring," says Gordon Edwards in Lawrenceville, Georgia. He continues, "Then, while monitoring and after pressing <PRI> to make the trunk activity indicators display, you can watch for the indicator on the far right of the display to light up. When it does, you be required) hexadecimal result. Some examples: convert the result to a 3-place (leading zeros may played by the scanner to its equivalent Motorola talkgroup value, divide the decimal value by 16 and "If you want to convert the decimal value displayed by the scanner to its equivalent Motorola talkgroup value, divide the decimal value by 16 and convert the result to a 3-place (leading zeros may be required) hexadecimal result. Some examples:

Why decimal numbers instead of hex?

Another Grove customer, calling our technical support line, asked me, "why does the 235 displays decimal subfield numbers instead of the hex numbers that Motorola uses?" Greg Knox, developer of the TrunkTracker displays Motorola talk group IDs as decimal values. It was not possible to make a seven segment LCD character to gracefully handle the alphanumerices that would be required for a hex

Johnson City Frequency Update

While talking with a Grove customer on our TrunkTracker work properly. The complete list of frequencies for Johnson City should read: 856-860-0875, 856-860-2375, 856-860-4625 MHz

Why decimal numbers instead of hex?

Another Grove customer, calling our technical support line, asked me, "why does the 235 displays decimal subfield numbers instead of the hex numbers that Motorola uses?" Greg Knox, developer of the TrunkTracker displays Motorola talk group IDs as decimal values. It was not possible to make a seven segment LCD character to gracefully handle the alphanumerices that would be required for a hex

Fancy keystrokes on the 235

Les Butler has discovered that the "235 appears to use some of the same keyboard commands to clear the radio as other Uniden models.

- <SVC, 2, 9> brings up the trunk mode with ci—hold. It loads bank 8 and 9 with 800 freqs. If you turn off the squelch you get 22222 in the display.
- <2, 9, E> makes all the display digits light up.
- <2, 9, Hold> loads all 300 freqs from 144.0 to 149.98 MHz.
- <2, 9, Search> will also get the same result.



know a phone patch is taking place, so you can exit trunk mode to go monitor the patch. In conventional mode I locked out all the channels except the phone patch frequency so all I need to do is hit <Trunk>, then <Scan> to monitor the trunked phonepatch."

Subfield ID
Trunkcracker

Hex ID
Motorola

16	001
32	002
48	003
496	01F
1040	041
2416	097
11536	2D1
12880	325
65520	FFF

Motorola
hex decimal

Trunkcracker
multiply

003	3 × 16 = 48
07D	125 × 16 = 2000
097	151 × 16 = 2416
AB9	2745 × 16 = 43920
FFF	4095 × 16 = 65520

"Note that this assumes that the decimal value is an integral multiple of 16. This should be the case for a Type II group ID. If you've got a system with lots of even and odd IDs, then you probably need to set your fleet map up as a Type I or Hybrid System. "If you want to go in the other direction and convert the Motorola hex value to the Trunkcracker value, do this: Convert the hex value to decimal and then multiply the result by 16. Don't add any leading zeros here. Some examples:"

Thanks to Greg and all the nice folks mentioned this month for checking in with Trunk Tracker information. There are a number of places new users can go to find and to share information. As he did this month, Rich Barnett will continue trunking coverage in "Scanning Report," since it's one of the most significant developments in scanning. However, he has a much broader beat to cover. "Tracking the Trunks" will be your dedicated source for tips and system profiles, especially for those of you without internet access.

If you are on the "Net, you should join the free internet newsgroup *Trunkcom*. All you have to do is send a message to *mdjordanio@grove.net*. In the body of the text type: *subscribe trunkcom*

You can also get the latest trunk system information and IDs on the internet's worldwide web at URL: <http://www.trunktracker.com>. If you have discovered new trunking frequencies or subfield IDs with your BC-235, we would like to feature them in *MT*. You can send the information or your trunk tracker questions to: *Trucking the Trunks*, P.O. Box 98, Brassstown, NC 28902-0098, or e-mail *trunkcracker@grove.net*.

A Window on the Spectrum



A quick note about the popular WiNRADiO. That's the radio that comes on a card and plugs into your computer, where everything is operated off the screen. WiNRADiO now comes with a full-fledged spectrum analyzer. You can actually see any signal presence on any span of frequencies between 500 kHz and 1.3 GHz. Double click the mouse on any signal spike and the receiver immediately tunes to that frequency! A storage feature allows recall of signal traces.

The entire WiNRADiO, which works best with Windows 3.1, 386 or higher, 1 Meg RAM, 1 Meg hard disk space, VGA monitor, or windows 95 requiring 486 or Pentium, 4 Megs RAM and an SVGA monitor, retails for \$589.95. If you don't own WiNRADiO, Grove Enterprises has it for \$499.95 (call 800-438-8155).



If WiNRADiO is already a part of your radio arsenal, you can download the new software for free from <http://www.winradio.com> or <http://www.winradio.net.au>. Refer to the Experimenter's Workshop column on page 82 for more on what this spectrum analyzer feature can do for you.

Return of the Drake

The R.L. Drake Company was, at one time, the radio hobbyist's

dream company. After the end of World War II, their radios became legend. Time passed, however, and the company quietly bowed out of the ham and shortwave market to concentrate on other radio communications equipment and satellite TV.

A few years ago, Drake reentered the shortwave receiver market. Apparently encouraged despite the decline of ham radio, it has now reentered the amateur market as well. The TR270 FM Transceiver is the only desktop FM transceiver on the market dedicated specifically to two meter operation.



According to the manufacturer, the TR270 is actually two radios. The first permits full two meter transceiver capability (142-150 MHz), while the second permits independent dual band reception (136-174 and 420-470 MHz.) This broad range lets users listen in on public service, marine, weather, and amateur bands. Advanced features include a quality dynamic microphone, an external DC input for mobile or emergency power operation, DTMF and CTCSS tone encoding, external audio-in jack for copying shortwave fax/data transmissions, external speaker jack, headphone jack and transmit time-out timer.

For more information on the TR270, call R.L. Drake at 513-746-4556 or visit their web site at <http://www.rldrake.com>.

Stubby Nubs

Years ago, when I was selling radio gear at DX Radio Supply, we'd get lots of orders for a small stubby ham antenna that was called the "Miracle Baby." It was odd. The antenna was advertised

as only an inch and we said up front that reception was poor. Despite the warning, for quite a while, we couldn't keep the things on the shelf. We couldn't figure out why anyone would want them!

Then someone told us. People buy them to use at the race tracks. They want antennas that don't drag in signals from everywhere. They consider distant signals interference and want only to hear the signals from the nearby drivers. Now we understood!

I no longer sell radio gear, but Grove does, and now stocks a "nub" antenna that does the same job at a very affordable price — \$9.95. This tiny 2-1/2 inch flex antenna concentrates your listening to the track. There's no distraction from unrelated communications. This antenna is designed for "close in" UHF communications — just like the pit crew and drivers. Says Grove, "It's the sure way to get the racer's edge!"

Grove also sells the Nub as a cheap, efficient antenna for any type of frequency counter or near-field receiver (whose stock antennas can run as much as \$35). Put your scanner antenna (that pulls in all the signals to be found in the surrounding three counties) on your frequency counter, and you may as well throw it away!

The Nub antenna is just \$9.95 plus \$5.50 UPS shipping. You can order by calling 800-438-8155, by visiting the www.grove.net web site, or by writing to Grove Enterprises at Box 98, Brasstown, NC 28902.



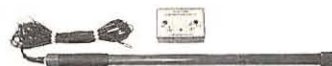
Compact Active Shortwave Antenna

The H800 Skymatch active antenna is a two-foot, compact powerhouse that performs like a 100 foot antenna. What's more, it

receives signals from 10 kHz through 50 MHz — that's VLF, medium wave, shortwave, and even VHF low band all rolled into one! (Not surprising, considering its manufacturer is LF Engineering — a longtime provider of accessories for longwave monitoring.)

The antenna operates either from 120 VAC or optional 9 volt batteries for portable or emergency use.

The wide dynamic range of this active antenna resists the strong-signal-overload problems common in active antennas, while its high sensitivity enhances weak signals. It mounts inconspicuously outside or inside (although that's not recommended because of electrical noise pickup).



The Skymatch includes the integrated active antenna, 50 feet of coax lead-in, control box, and AC adaptor, and is available from Grove Enterprises for \$99.95 plus \$8 UPS shipping. You'll also need a kit to adapt the RCA female plug on the control box to your radio with a piece of coax in between. \$8.45 will get you the adapters plus 3 foot cable from Grove (please specify the antenna connector on your radio), or you can homebrew your own.

— RB

Access to the Airwaves

Allan Weiner is a name known to most radio hobbyists. He seems to be a man possessed with an idea: to put pirate radio stations on the air. That's an oversimplification, but regardless, you either see him as a hero, crazy, or (if you're with the FCC), an enemy of the government.

After all, this man has done things that others have only dreamed about. He's put radio

stations on the air from his parents' home. He's purchased rusting old boats, parked them in international waters, and put radio stations on them. He's had run-ins with the authorities (the FCC seized the *M/V Sarah* in 1987 during a commando raid) that would curl the hair of lesser people. He's reached the pinnacle of his profession, working at the networks in New York City.

Weiner lives, breathes, and eats radio. And he refuses to stop. Ever since his childhood, Weiner has been a radio genius and freak. The movie *Pump Up the Volume* appeared to be loosely based on his early teenage adventures. He's gone on to put radio station after radio station on the air, often disregarding official rules in the belief that the airwaves are free.

Access to the Airwaves is the title of Weiner's life story. At times a bit self-indulgent, it is the story of a decent ex-hippie, who still clings to the idealism of the 1960s. It's an

interesting book that I'm willing to guess contains parts that you'll recognize from your own radio life, or wish you did. In any case, it's a good read and recommended reading for anyone who enjoys hobby radio.

You can get a copy of *Access to the Airwaves* by Allan Weiner as told to Anita Louise McCormick from Universal Radio. The price is \$17.95 plus \$2.00 book rate or \$3.00 UPS shipping. Their phone number is 800-431-3939 or you can write to them at 6830 Americana Pkwy, Reynoldsburg, OH 43068. Mention *MT* when you call.

Happy 17th, Dr. Bruce

Bruce Elving has put out the 17th edition of *FM Atlas*. Elving's unique work lists

10,000 FM stations and translators across the United States, Canada, and Mexico and plots their location on 109 pages of maps. Station directories are arranged by geography and frequency. The book gives program formats, stereo and technical data, SCS subcarrier information, plus station coverages.

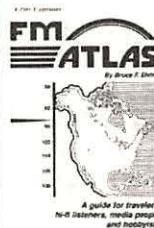
Articles include the new Telecom Act and how the listener and broadcaster might be affected, monophonic talk radio, RADAR Report on FM listening, digital audio broadcasting, a CBC "power grab" in Canada, and FM "microbroadcasters."

There are several sources for this 224-page book. Grove En-

terprises carries it for \$14.95 plus \$2.50 bookrate shipping. Or, if you enjoy FM broadcasting and DXing, you can send Dr. Elving \$16.95 plus \$1.55 shipping for the *FM Atlas* and enclose another \$4.50 for a sample copy of his monthly updater/newsletter, *FMedia!*. The address is P.O. Box 336, Esko, MN 55733-0336.

GMRS Repeater Guide

There are some 3400 repeaters licensed to the General Mobile Radio Service (GMRS) nationwide. Now 50 years old, the GMRS hosts private individuals, families, user co-operatives, and volunteer service teams comprised of more than



DEDICATED TO THE SCANNING AND SHORTWAVE ENTHUSIAST. WE'RE MORE THAN JUST SOFTWARE!

COPYCAT-PRO

The ONLY Commercially Available Computer Control Program for the Universal M-7000 & M-8000.



Also, AEA's PK-232 and the MFJ-1278.



COPYCAT-PRO FEATURES

- 32K incoming text buffer.
- Pull down menus.
- Mouse support (but not required).
- Runs on any 640K PC-Compatible.
- New improved online help.
- Control BOTH your TNC and radio simultaneously!
- Multiple pop-up windows for HELP, frequency files, and text editor.
- Supports ALL SCANCAT files.
- Easier: "Plain English" MACRO language for control of all radio and TNC functions.
- Supports most radios. Call for info!

Discover our revolutionary COMPUTER CONTROL PROGRAM for the M-7000, M-8000, PK-232, and MFJ-1278. Let COPYCAT-PRO free you FOREVER from remembering all those buttons and keys. COPYCAT-PRO does it all! Simple "PULL-DOWN" menus control all functions. ALL commands are in plain English "PLUS" COPYCAT-PRO has a fully editable text buffer, with cut & paste, 20 PROGRAMMABLE macros and much more. COPYCAT-PRO supports ALL of the above units within ONE program.

COPYCAT-PRO \$79.95, UPGRADES \$24.95

S/H \$5.00 (\$7.50 Foreign)

Specially wired cable for the M-7000/8000 \$24.95

CAT-WHISKER

TIRED OF YOUR HANDHELD SCANNER ALWAYS FALLING OVER JUST TO KEEP THE ANTENNA "VERTICAL"?



Try our unique, swivel base, telescopic scanner antenna. Our new CAT-WHISKER lets you lay your handheld scanner on its back and still keep the antenna vertical!

- Swivels to ANY angle.
- Easily adjusts to any length AND frequency.
- Fits ANY scanner with a BNC antenna connector.
- Fits on BACK or TOP mount scanner antennas inputs.

CAT-WHISKER #1 (5 to 23 inches)

\$19.95

CAT-WHISKER #2 (6 to 36 inches)

\$24.95

(plus \$2.50 S & H)



Order direct or contact your favorite dealer

FREE DEMOS ON THE WEB

INTERNET WEB ADDRESS - <http://www.scancat.com> WEB E-MAIL - scancat@scancat.com

(S & H \$10 US, \$15 Foreign)

COMPUTER AIDED TECHNOLOGIES

Phone: (318) 687-4444 FAX: (318) 686-0449
Live Tech Support (318) 687-2555 (9 am - 1 pm Central M-F)

P.O. Box 18285 Shreveport, LA 71138

Orders Only
888-SCANCAT
888-722-6228

HOKA CODE-3 USA Version

"The Standard Against Which All Future Decoders Will Be Compared"

Many radio amateurs and SWLs are puzzled! Just what are all those strange signals you can hear but not identify on the Short Wave Bands? A few of them such as CW, RTTY, Packet and Amort you'll know - but what about the many other signals?

There are some well known CW/RTTY Decoders but then there is CODE-3. It's up to you to make the choice, but it will be easy once you see CODE-3. CODE-3 has an exclusive auto-classification module that tells YOU what you're listening to AND automatically sets you up to start decoding. No other decoder can do this on ALL the modes listed below - and most more expensive decoders have no means of identifying ANY received signals! Why spend more money for other decoders with FEWER features? CODE-3 works on any IBM-compatible computer with MS-DOS with at least 640kb of RAM, and a CGA monitor. CODE-3 includes software, a complete audio to digital FSK converter with built-in 115V ac power supply, and a RS-232 cable, ready to use.

CODE-3 is the most sophisticated decoder available for ANY amount of money.

26 Modes included in STANDARD package include:

- Morse *
- RTTY/Baudot/Murray *
- Sitor CCIR 625/476-4
- ARQ - Navtex *
- AX25 Packet *
- Facsimile all RPM (up to 16 gray shades at 1024 x 768 pixels *
- Autospec - Mk's I and II
- DUP-ARQ Attrac
- Twintex
- ASCII *
- ARQ6-90/98
- SI-ARQ/ARQ-S
- SWED-ARQ-ARQ-SWE
- ARQ-E/ARQ1000 Duplex
- ARQ-N-ARQ1000 Duplex Variant
- ARQ-E3-CCIR519 Variant
- POL-ARQ 100 Baud Duplex ARQ
- TDM242/ARQ-M2/4-242
- TDM342/ARQ-M2/4
- FEC-A FEC100A/FEC101
- FEC-S * FEC1000 Simplex
- Sports info 300 baud ASCII
- Hellsreiber-Synch/Asynch *
- Sitor * RAW (Normal Sitor but without Synch.
- ARQ6-70
- Baudot F788N
- Pactor *
- WEFAH *

All modes in typical baud rates with possibility of changing to any desired value of speed and shift.

User can save incoming data to disk in either ASCII or raw bit form.

STANDARD CODE-3 DECODER

\$595.00 + S & H

Includes: ALL Modes, Plus Oscilloscope*, ASCII Storage, Auto Classify*, and PACTOR* Options

with ALL EXTRA OPTIONS \$795.00 + S & H

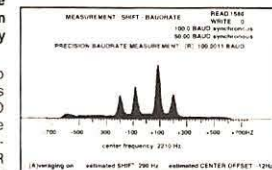
CODE 3 - GOLD VHF/SW DECODER

\$425.00 + S & H

includes POCSAG & ACARS Plus * Modes/Options

with ALL EXTRA MODES/OPTIONS \$595.00 + S & H

ALSO AVAILABLE - HOKA CODE-30 DSP-based Professional Decoder - CALL FOR PRICE



Simulated Speed Measurement Module

EXTRA OPTIONS

	REG. PRICE
Piccolo	\$85.00
Coquelet	\$85.00
4 special ARQ & FEC systems:	
TORG-10/11, ROU-FEC/ RUM-FEC, HC-ARQ (ICRC) and HNG-FEC	\$115.00
SYNOPSIS decoder	\$85.00

16,000 licensees.

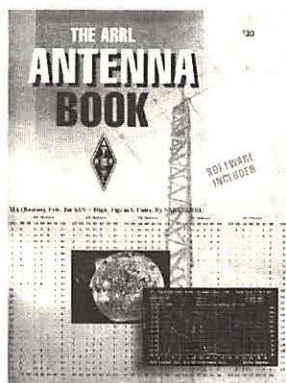
The new guide offers excellent question-and-answer sections about GMRS, then continues with an exhaustive, state-by-state list of repeaters, showing channels in use, coverage, control operator addresses and phone numbers, and area of coverage: everything you need as a licensed GMRS to access these repeaters as you travel across the country.

The *GMRS National Repeater Guide* 10th Edition is \$25 from the Personal Radio Steering Group, PO Box 2851, Ann Arbor, MI 48106; ph. 313-662-4533.

—BG

The ARRL Antenna Book

Few publications rate—or deserve—the accolades given the *Antenna Book* published by the American Radio Relay League



(ARRL). Of course, after decades of revisions, it ought to be good! And it is; this latest 18th Edition (1997) is packed with solid, accurate information of use to the experimenter and professional alike. It would be reasonable to expect that every serious antenna lab in the world has a copy.

More than 700 pages present material on nearly any imaginable antenna topic, from LF through microwave, terrestrial to

satellite, mobile and base, portable and fixed, enormous and compact. If it responds to an RF field, it's probably in the handbook!

Chapters evolve logically from fundamentals and earth effects on through site planning. From there the ptome exhaustively and expertly treats beams, wires, direction finding, repeater antennas, space communications, transmission lines, transmatches ("tuners"), and signal propagation.

As always, the *Antenna Book*, edited by R. Dean Straw, N6BV, is lavishly illustrated with photos, line drawings, charts, and graphs. It is accompanied by a PC program disk to aid in design of many antennas described within its covers. For anyone interested in building or understanding antennas, this book is a must! It's available from Grove Enterprises for \$29.95 plus \$6 shipping.

—BG

Books and equipment for announcement or review should be sent to "What's New?" c/o Monitoring Times, P.O. Box 98, 7540 Hwy 64 West, Brasstown, NC 28902 Press releases may be faxed to 704-837-2216 or e-mailed to mteditor@grove.net.

DEDICATED TO THE SCANNING AND SHORTWAVE ENTHUSIAST. WE'RE MORE THAN JUST SOFTWARE!

INTRODUCING . . . SCANCAT GOLD for Windows

Since 1989, The Recognized Leader in Computer Control

Once you use SCANCAT with YOUR radio, you'll NEVER use your radio again WITHOUT SCANCAT!

SCANCAT supports almost ALL computer controlled radios by: AOR, DRAKE, KENWOOD, ICOM, YAESU and JRC (NRD) Plus PRO-2005/6/35/42 (with OS456/535), Lowe HF-150, and Watkins-Johnson.

SCANCAT'S BASIC FEATURES

- Search between any 2 frequencies
- Search by ANY increment.
- Create Disk files.
- Import from most text formats to a working SCANCAT file.
- Unattended Logging of frequencies to files while scanning.
- Scan Disk Files.
- Spectrum Analysis to Screen OR Printer.
- Supports PerCon & Mr. Scanner CD Roms.

PLUS

- LINK up to 15 Disk files.
- Scan VHF & HF Icom's Simultaneously.
- Print to ANY printer or Disk files.
- MULTIPLE search filters for Diskfile Scanning.
- Search by CTCSS & DCS tones with OS456/535 or DC440 (ICOM only).
- INCLUDES several large shortwave and VHF/UHF databases

POWERFUL COMMERCIAL FEATURES SUCH AS:

- Demographic search for frequency co-ordination and 2-way Usage Analysis.
- Exclusive "MACRO" control: frequency of Dwell, Hang, Resume, Sig. Threshold and even 6 seconds programmable, audible alarms.
- Detailed logging to ASCII type files with DATE, TIME, Sig Str, Air Time.
- Command line options for T, ED, OFF (Unattended) logging/searches.
- UNLIMITED file sizes with our exclusive SCANCAT filing method.

EXCLUSIVE WINDOWS FEATURES

All the features you EXPECT from a true Windows application such as:

- NO MORE CONVERSION! DIRECT scanning of most DBASE, FOXPRO, ACCESS, BTRIEVE files WITHOUT "importing". Our Exclusive "AUTO-PLAN" even sets the mode and increment on the fly!
- UNIQUE database management system with moveable columns. Even SPLIT columns into doubles or triples for easy viewing of ALL important data on one screen.
- VERSATILE "Functional" spectrum analysis. NOT just a "pretty face" Spectrum is held in memory for long term accumulation. Simply "mouse over" to read frequency of spectrum location. "CLICK" to immediately tune your receiver. You can even accumulate a spectrum from scanning DISKFILES of random frequencies!
- Exclusive "SLIDE RULE" tuner. Click or "skate" your mouse over our Slide-Tuner to change frequencies effortlessly! OR use our graphical tuning knob.
- INTERACTIVELY have database, MAPS or Scanning functions on screen simultaneously.
- MAPS - Load virtually ANY map or GRAPHIC image in "BMP" format (several included with Scancat). Program "hot spots" with your favorite frequencies. Up to 1000 frequencies per map. Click on Hotspot to immediately tune your receiver.
- A Complete Modem/Terminal with support for most current modems. Full X-Y-Zmodem download upload support up to 28,800.

SCANCAT GOLD FOR DOS.....\$94.95 + S & H*

SCANCAT GOLD FOR WINDOWS.....\$99.95 + S & H*

UPGRADE from any version.....\$29.95 + S & H*

*\$5 U.S.
\$7.50 FOREIGN

MAGIC for Windows

PUT SOME ORDER IN YOUR LIFE!

MAGIC takes any ASCII text file from virtually any source, and any format, and creates "frequency files" or ordered lists.

- Corrects inconsistent column alignment
- "Looks for" single or multiple frequencies embedded in ASCII text.
- Print to file or printer.
- Reads or writes to: SCANCAT, plain text, comma delimited, and dBase.

MAGIC for Windows
\$34.95
(plus \$5.00 S & H)

LIMITED TIME OFFER!

Scancat Gold for Windows \$99.95
Magic for Windows 34.95
Disk of Frequency Files 15.00
Regular Price \$149.90
SPECIAL \$124.95
Limited Time Thru 9/30/97
PLEASE ASK FOR "SPECIAL SCGM"

"UNI-VERSATILE" INTERFACE

- Supports ICOM/IC-R10, AR8000, YAESU and SCOUT.
 - Comes with 6 FOOT cable, and adapters to fit all units within a single package (Must Specify Yaesu)
 - Unlike "single radio" adapters, can be used with ANY radio supported, simply change the adapter, then "Plug and Play"
 - Expandable in future with a simple add on adapter.
 - No external power required. Draws power from computer.
 - "Reaction Tune" scout with NO modifications to radio.
- CAT-232C "UNIVERSATILE INTERFACE"**
\$99.95 + s & h



NOW IN STOCK

DEALER INQUIRIES INVITED

INTERNET WEB ADDRESS - <http://www.scancat.com> WEB E-MAIL - scancat@scancat.com

Order direct or contact your favorite dealer.

COMPUTER AIDED TECHNOLOGIES

P.O. Box 18285 Shreveport, LA 71138

Phone: (318) 687-4444 FAX: (318) 686-0449

Live Tech Support (318) 687-2555 (9 am - 1 pm Central M-F)

FREE DEMOS ON THE WEB

Orders Only

888-SCANCAT
888-722-6228

Drake's Affordable New SW2 Tabletop

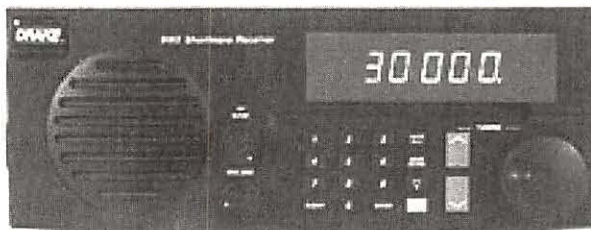
With the introduction of the new SW2, the folks at the R.L. Drake Company are reaching for a very interesting spot on the price/performance curve of shortwave tabletop receivers: a model that delivers solid performance for less than \$500.

■ Many features for price, plus intuitive ergonomics

There's a lot to like about the SW2. It is a relatively small receiver, only 10-7/8 inches wide by 4-3/8 inches high by 7-5/8 inches deep, including front knobs and rear panel connector. On the front panel is a forward-firing speaker, a knob for RF gain and another for volume. At top right is a bright yellow, green and red display with a bar-graph signal strength meter, a XXXXX.X frequency readout, and indicators for AM, SYNC, LSB, USB, POWER, MEM and METER. There is also a numerical display that shows either the memory preset that is being used, or the shortwave or ham meter band to which the receiver is tuned.

Just below the display to the right is a large plastic tuning knob with knurled edges and a handy "speed" dimple. To the left, a group of 18 buttons helps to control the SW2. They include UP and DOWN slewing buttons, a 3 x 3 over 1 telephone-style keypad, a button for turning the receiver on and off, a CLEAR button, a MEM button, an AM SYN. button, a button for toggling between upper and lower sideband, and a button for dimming the display. In all, no gripes about ergonomics—the layout is intuitive and easy to use.

The headphone jack, curiously, is located on the left hand side of the case and, bowing to the fading era of 1/4-inch headphone jacks, the connection is a mini-plug, such as used on Walkmans and other personal listening devices. On the back panel of the SW2 are an SO-239 connector for hooking up and coax-fed antenna, a pair of screw terminals for a wire antenna and a ground connection, a jack for an external speaker and a power input. Power, alas, is supplied by an external "wall wart" transformer. While these are not the norm in tabletop receiver design, external power supplies are increasingly being used even in tabletop receivers, as this allows the radio to be exempted from UL approval (only the outboard AC adaptor has to be approved).



*Receiver sensitivity is good, excellent or superb across the radio spectrum covered. Image rejection is good, and dynamic range measured at 20 kHz is superb. This is truly an excellent showing for a relatively inexpensive tabletop receiver, and better than some costly "supersets" we've tested at *Passport to World Band Radio*.*

The SW2 offers frequency coverage from 100 kHz to 30 MHz with AM, synchronous selectable sideband, and upper (USB) and lower (LSB) sideband. The SW2 includes 100 independent, programmable memories that store frequency, mode and detector mode—these memories do not require battery backup power to maintain stored information. In addition, memories 1 through 32 have been preprogrammed at the factory with stations ranging from the BBC to the Voice of Vietnam to Radio Denmark—a beside-the-point feature for experienced listeners, but an aid in getting started for newbies.

While the SW2 offers synchronous selectable sideband to increase long-term program listening pleasure, as well as single-sideband for receiving ham and utility signals, there are none of the sophisticated controls, such as passband tuning and a notch filter, that dedicated DXers have come to cherish for squeezing the last erg out of a faint signal.

The SW2 is straightforward to operate. To enter a frequency, such as 5070 for WWCN, simply press the keys 5 - 0 - 7 - 0, wait a moment, then the frequency automatically pops up. Or, if you're impatient, either of the slewing buttons can be used as an ENTER key at the end of the sequence. Once entered, the frequency can also be changed in 5 kHz steps with the UP or DOWN slewing buttons, or in relatively coarse 50 Hz steps using the tuning knob.

Sometimes when using the tuning knob, a faint rasping (r-r-r-r-r-r) or chugging sound can be heard in the background, but it is never so loud that it seriously interferes with hearing signals—a big improvement over the cheaper Drake SW1.

To access a memory channel (preset), simply press the MEM button, then the SW2 will automatically tune to the memory channel

last accessed. If you want a different memory channel, you can get there easily by using either the tuning knob or the slewing buttons.

Storing information in a memory channel is equally easy. Press and hold the MEM button for at least two seconds, whereupon the SW2 is put in the memory-store mode. Now, select the memory channel you want to use with the keypad, then press MEM again. That's it.

If you are unsure of which memory channel you want to use, you can scroll through the memory channels using the slewing buttons or the tuning knob until you find the one you want.

■ Pleasant audio, generally superior lab results

The SW2 has pleasant audio quality, and our laboratory measurements confirm that most measurements of distortion are excellent-to-superb. This is important not only for enjoyable listening to programs hour-after-hour, but also to maximize intelligibility with DX catches.

The SW2 acquits itself well in other measurements of receiver performance. To begin with, receiver sensitivity is good, excellent or superb across the radio spectrum covered. Image rejection is good, and dynamic range measured at 20 kHz is superb. This is truly an excellent showing for a relatively inexpensive tabletop receiver, and better than some costly "supersets" we've tested at *Passport to World Band Radio*.

■ Two flaws, one serious

Unfortunately, the SW2 contains two flaws, one serious. The lesser is that the receiver's synthesizer is not as clean as it could be. While this is not readily apparent to the ear except

when, for example, listening to a weak signal adjacent to a powerful signal, the "dirty" synthesizer makes some precise measurements of receiver performance nearly impossible to perform. For example, we couldn't measure dynamic range at 5 kHz spacing because of synthesizer noise.

The other, far more serious, flaw, is sub-standard selectivity, or adjacent-channel rejection. To begin with, the bandwidth is not selectable independent of mode. This means that only the wider of the two voice bandwidths can be used for AM-mode listening—unless you have the fingers of a safecracker, and use the single-sideband "ECSS" mode to manually tune for zero-beat.

The AM bandwidth is nominally 6 kHz, but actually measures 7 kHz at 6 dB and 15 kHz at -60 dB. This not only is relatively wide for world band reception, but its shape factor is only so-so by today's standards.

This means, among other things, that stations can be heard in the clear 5 kHz off their center frequency. As a result, if you are listening to a station on one frequency, and there is another one 5 kHz away, you are going to hear more interference from it than you should, and that's going to diminish your listening pleasure. Synchronous selectable sideband helps rescue the day, but only if the other sideband is well and truly free from adjacent-channel interference.

In addition, the 2.3 kHz (nominal) sideband filter measures 2.7 kHz at -6 dB, with circuit leakage to 15 kHz. It's not a level of performance that will warm the hearts of utility DXers, hams or SWLs using ECSS tuning.

■ Overall: Ferrari with VW engine

In short, the SW2 very much needs at least a couple of well-chosen, leakage-free voice bandwidths, selectable independent of mode, to realize its full potential.

In designing the SW2, the engineers at Drake have come close very close to achieving the goal of creating a worthy performer for less than \$500. But with the present bandwidth arrangement, this receiver falls well short of what it should be.

■ Sony SWL booklet finally available

Several readers have contacted me to ask why the new Sony world band radio booklet, "Tune Into the World" (item C8159, 3/97), mentioned in the May column, was not available from the usual Sony order number. Turns out that some communications lines were crossed, but now the booklet can be obtained, free, from the Sony Customer Information Center at (800) 222-7669.

This equipment review is performed independently by Lawrence Magne and his colleagues in accordance with the policies and procedures of International Broadcasting Services, Ltd. It is completely independent of the policies and procedures of Grove Enterprises, Inc., its advertisers and affiliated organizations.

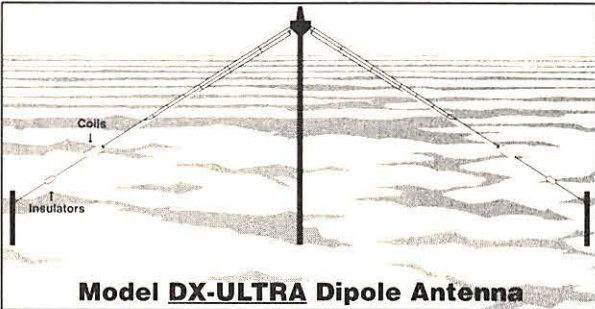
The Drake SW2 Shortwave Receiver is available from Grove Enterprises (800-438-8155) for \$489.95 plus \$14 UPS shipping in the U.S.

RADIO DATABASE INTERNATIONAL WHITE PAPER® reports contain virtually everything found during exhaustive tests of premium shortwave receivers and outdoor antennas. For a complete list, please send a self-addressed stamped envelope to RDI White Papers, Box 300M, Penn's Park PA 18943 USA; or go to www.passport.com.

Imagine . . .

A shortwave antenna so good you won't need or want any other type of antenna system!

With the ALPHA DELTA Model DX-ULTRA Full Spectrum Dipole you don't have to imagine anymore! We designed it for "knock-your-socks-off" performance with an absolutely no-compromise attitude — with full frequency access from AM Broadcast through 30MHz!



Model DX-ULTRA Dipole Antenna

- Absolutely remarkable performance for Medium Wave, Tropical, International Shortwave, Government, Military, Embassy, Maritime, Aircraft, Commercial and all other Utility communication frequency ranges.
- The DX-ULTRA design provides extremely low-noise performance for maximum sensitivity to weak DX signals.
- The wire elements' "Tapered Wing" design allows broadband operation on 1/2 wavelength and 3/4 wavelength multiples of various frequency ranges.
- The DX-ULTRA is designed with a pair of ISO-RES inductors and parallel wire elements for maximum broadband, efficient performance - no lossy narrowband traps. The difference on your S-meter can be phenomenal!
- Our exclusive Model DELTA-C Center Insulator with the built-in Model SEP ARC-PLUG® Static Electricity Protector provides effective protection for your sensitive receiver components. Connectors accept either coax or balanced line.
- Overall length of the DX-ULTRA is only 80 feet with dipole, inverted-vee, or full sloper configurations possible!
- Fully assembled - no cutting or soldering required. All components are rated for 2kW of power with all stainless-steel hardware. Can be used with a wide-range antenna tuner for commercial, military, or embassy operation.
- The DX-ULTRA is designed specifically for full spectrum shortwave performance, not just for the narrower amateur or international shortwave bands.

Alpha Delta Model DX-ULTRA, 80 ft. in length . . . \$119.95

If your space does not permit the full 80 ft. length of the DX-ULTRA, we suggest our Model DX-SWL 1/4 wave sloper (60 ft.) or our DX-SWL-S 1/4 wave sloper (40 ft.). These antennas have similar design philosophies.

At your Alpha Delta dealer or add \$5.00 for shipping and handling in the continental United States. Export orders - please call for quote.

ALPHA DELTA COMMUNICATIONS, INC. AA

P.O. Box 620, Manchester, KY 40962 • 606-598-2029 • FAX 606-598-4413
current solutions to current problems

Radio Shack PRO-64 Portable Scanner

Radio Shack's new PRO-64 is a triple conversion, 400 channel portable scanner made in Japan by General Research Electronics. Frequency coverage is similar to the 1994 vintage PRO-62 it replaces, but the PRO-64 includes several new firmware features, including multiple search banks and the ability to be programmed via a personal computer.

The PRO-64 tunes 29 - 54, 108 - 174, 380 - 512, and 806 - 960 MHz, excluding the cellular telephone bands. AM or NFM modes can be selected on any frequency, though AM is the default mode used in the civilian aircraft band.

■ Twice the Memory and Full Featured Scanning

The PRO-64's 400 memory channels are divided into 10 banks. Memory backup is specified to be just one stingy hour during power loss, but our PRO-64's memories remained intact after 22 hours without power. You can program the same frequency into different memory channels, but the display will alert you to the duplication. A 2 second rescan delay may be selected for individual channels.

A brief keystroke sequence sorts the channels within a selected bank in ascending or descending frequency order. This doesn't affect the scan rate, which we measured at about 25 channels/sec — as fast as a PRO-2006.

Empty channels (those programmed with 0.0), are automatically skipped during memory scan, so no time is wasted.

There are 10 priority channels and they are independent of the 400 conventional channels. We found the priority feature worked well, without chopping up nonpriority signals harshly. Priority sampling can be used during searches, too, as in the early Electra/Bearcat models.

Frequencies can be stored in any of 40 Monitor channels and later transferred individually or *en masse* to conventional memory. A simple keystroke sequence zeroes all locked out channels in any bank you choose.

■ Rich Search Repertoire

The PRO-64 provides several ways to search for signals, including Direct, Band, Bank, and Auto searching. Direct search, using the up and down arrow keys, searches from the display frequency in the direction of your choosing. You can also enter a search window size from 1 to 10 MHz to bound the direct search, a new feature for GRE.

There are 10 pairs of user programmable limits for bank searches, and you can link banks in various combinations. There are 14 Band search banks preprogrammed with factory-set limits, e.g., 50 - 54, 144 - 148 MHz, etc., but the Band limits cannot be altered.

The crowning jewel is the Auto store, which searches between one pair of programmable frequency limits and silently stores active frequencies into one or more memory banks of your choice. Duplicate frequencies are not stored.

You can lock out up to 200 frequencies during searches, and review each one later, unlocking frequencies if you like.

Pressing the WX key starts a scan of 11 NOAA weather channels.



Photo by Pam Parnass, N9HRZ

■ Powering the PRO-64

The PRO-64 is furnished with the familiar battery tray which holds 6 AA cells. It's the same tray used by the PRO-43, PRO-62, PRO-60, and other GRE-made portables. In a departure from the past, the PRO-64 does not support charging of AA cells while they are inside the scanner. It has no Charge jack, but does have an external 9 VDC power jack with a 1.3 mm inner diameter/3.4 mm outer diameter.

Options include Radio Shack's AC adapter (#273-1665), DC adapter (270-1560), and a monolithic NiCd pack (#23-288). The only way to charge a battery inside the scanner is to buy Radio Shack's optional NiCd pack and recharge it using either the AC or DC adapter. A 22 ohm 1/4 watt resistor inside the PRO-64 limits charge current to about 410 mA if the adapter furnishes 9 VDC.

Battery current consumption has increased 8% over the PRO-62 we reviewed in February 1995 *MT* (see current consumption chart). The well written owner's manual does not mention a battery saver feature and our measurements showed the PRO-64 consumed a constant 95 mA while squelched.

■ Other Features

The owner's manual mentions that the PRO-64 can be programmed using a personal computer, but the optional data interface kit was not available at review time.

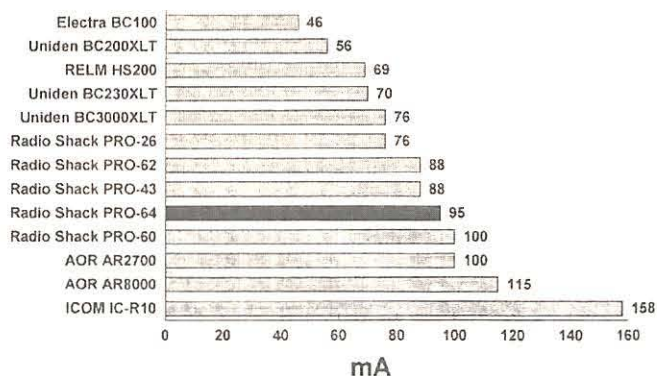
The LCD display on our scanner had sharp contrast, but only when the radio was tilted at the proper angle instead of looking straight at the display at a right angle. Pressing the Light key illuminated the display for 5 seconds, but it was too dim.

Keystrokes are confirmed by a beep tone, but the tone can be disabled by pressing the 2 and Enter keys during power up.

■ Performance

Our PRO-64 had better audio quality than our stock PRO-43. Its small speaker produced clean audio unless the volume control was cranked up. The squelch was well behaved, with the proper amount of hysteresis and short

Portable Scanner Current Consumption
Measured While Scanning



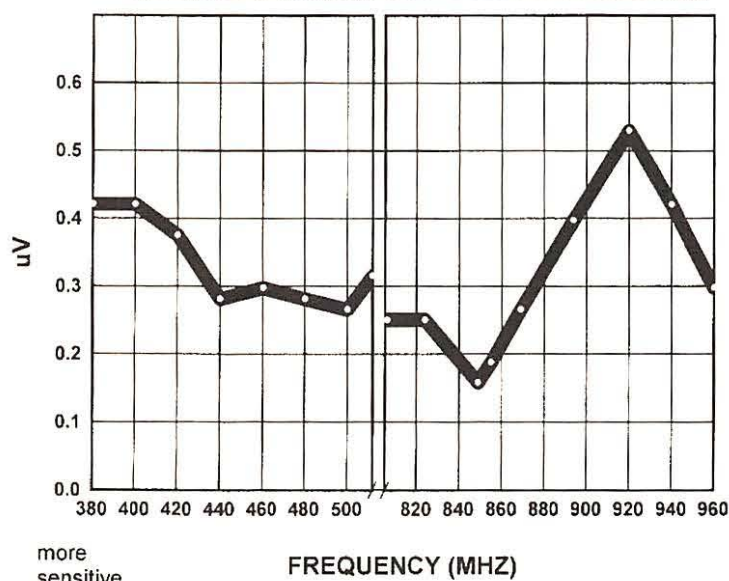
Note: One sample of each model tested

Copyright 1997 Bob Parnass, AJ9S

less
sensitive

PRO-64 UHF NFM SENSITIVITY

12 dB SINAD, 3 KHZ DEVIATION, Serial #001065

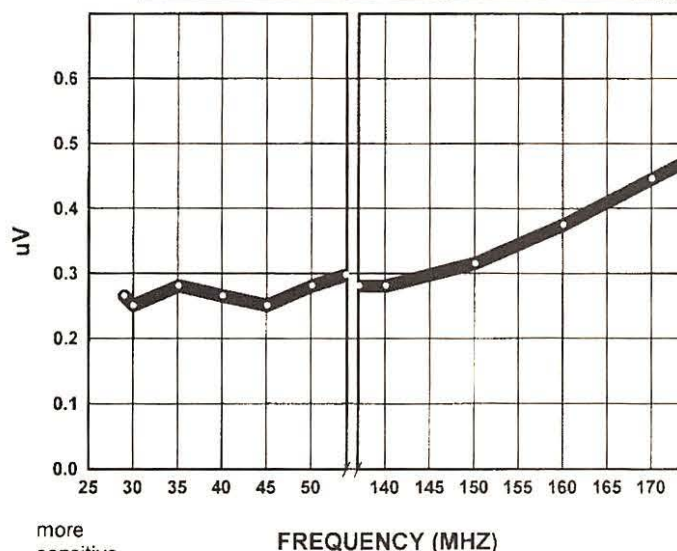


more
sensitive

less
sensitive

PRO-64 VHF NFM SENSITIVITY

12 dB SINAD, 3 KHZ DEVIATION, Serial #001065



more
sensitive

"tail."

Bench and field tests show our PRO-64 to have little intermod and adequate sensitivity (see graphs).

When fitted with a 12 inch Austin Condor antenna, we enjoyed monitoring the simplex mobile-to-mobile chatter on 151.625 and 464.5

MHz as well as in-store communications in the 467 MHz band. We observed a little intermod when using an outdoor Antenna Specialists AV801 antenna in a rural/suburban setting, but detected no image interference in the 160 - 162 MHz range which would prove troublesome for railfans.

We parked 2000 feet away from a cellular telephone tower and searched the 855 - 869 MHz range to ascertain whether our PRO-64 would experience interference from cellular phones. Our PRO-64 was clean in the 800 MHz range, but we heard cellular phone signals both in the civilian air band and from 48.25 to 54 MHz, even when we removed the antenna.

Later, we measured the PRO-64's cellular rejection at about 64 dB in the air band and 48 dB in the VHF-low band. The signal-to-display frequency relationship on the VHF-low band was:

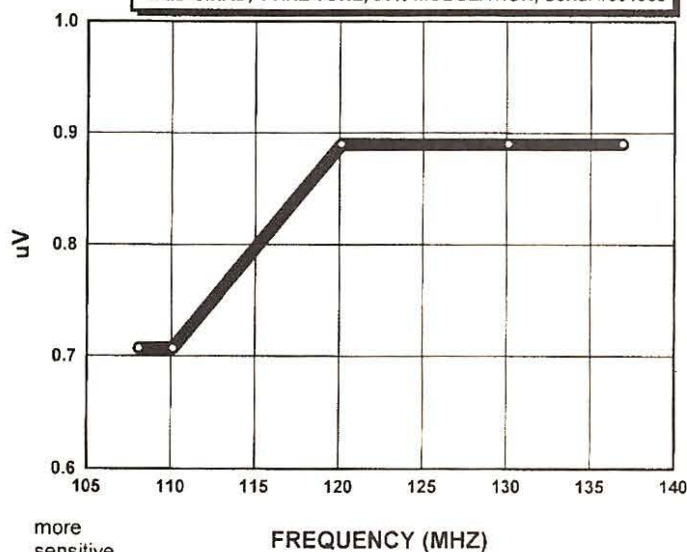
$$\text{Actual transmitter frequency} = 772.5 + (2 * \text{display frequency})$$

For example, we could hear a 870.0 MHz signal when the PRO-64 was programmed with 48.75 MHz, though the 12 dB SINAD sensitivity was only 75 uV.

less
sensitive

PRO-64 VHF AIR BAND AM SENSITIVITY

12 dB SINAD, 1 KHZ TONE, 30% MODULATION, Serial #001065



more
sensitive

TABLE 1: Measurements, Radio Shack PRO-64 Portable Scanner S/N 001065

Frequency coverage (MHz):

- 29 - 54 (5 kHz steps)
- 108 - 136.975 (25 kHz steps)
- 137 - 174 (5 kHz steps)
- 380 - 512 (12.5 kHz steps)
- 806 - 824 (12.5 kHz steps)
- 849 - 869 (12.5 kHz steps)
- 894 - 960 (12.5 kHz steps)

Sensitivity: see graphs

FM modulation acceptance: 9.7 kHz

Image rejection: 30.5 dB at 155 MHz.

Audio output power, measured at earphone jack: 171 mW @ 10% distortion

Memory scan speed: 25 channels/sec.

Search speed, 5 kHz step: 50 steps/sec.

Search speed, 12.5 kHz step: 50 steps/sec.

Current consumption at 9.0 VDC:

off - less than 10 uA

manual - 95 mA

scan - 95 mA

full volume - 169 mA

No battery saver action observed

Low battery warning at 5.8 VDC or less

Intermediate Frequencies:

257.5, 21.4, and 0.455 MHz

In Closing

The PRO-64 is a good performer with a rich set of features and is a major improvement over the PRO-62. Drawbacks include short memory retention time rating, dim display backlight, and inability to charge AA NiCd cells while in the radio.

RadioMap™

Transmitter sites in your area are researched and marked on a beautiful 8 1/2 x 11 full color plot. See FCC licensed sites from VLF through microwave including police, fire, cellular phone sites, business, industrial, broadcasters and selected FAA transmitter sites. Call signs, frequency assignments, and names provided. Ham radio stations not included.

You choose the map center location - your neighborhood, near your office, around sports stadiums - anywhere within the United States. We adjust map coverage for best readability, depending on transmitter site density. Invaluable to radio professionals and hobbyists for identifying towers, sources of radio interference etc. Send nearest street intersection and check for \$29.95 payable to Robert Parnass.

Robert Parnass, M.S.
Radio Electronics Consulting
2350 Douglas Road, Oswego, IL 60543

Using a Counterpoise to Aim High

A counterpoise, according to the *IEEE Standard Definitions of Terms for Antennas*, is "a system of conductors, elevated above and insulated from the ground, forming a lower system of conductors of an antenna." A counterpoise, by virtue of being close to the earth, gives a relatively low-impedance, capacitively-coupled path to earth. This is particularly useful when the antenna is used above dry or rocky earth, which provides a poor RF ground.

A counterpoise can be as simple as a single wire stretched below an antenna, insulated from ground and connected to nothing (fig. 1).

What does it do for an antenna?

If we put a counterpoise under a vertical antenna it usually makes the antenna more efficient. That means that it radiates or captures more of the available signal. A counterpoise will also sometimes lower the vertical antenna's vertical radiation/reception patterning. This is often desirable because a lower vertical radiation/reception pattern leads to greater responsiveness to DX signals.

But vertical antennas for the HF bands are

so tall as to be difficult or impossible for most of us to erect, especially on the lower end of that band. So homebrew antennas which use a counterpoise are most frequently horizontal antennas.

A horizontal dipole mounted 1/10 to 1/4 wave above a counterpoise directs most of its responsiveness upwards. Just as low-angle vertical radiation/reception patterning is best for DX HF signals, a high-angle vertical radiation/reception pattern is best for receiving signals from closer HF stations. The high angle of responsiveness of such an antenna leads to the name "near vertical incidence skywave" (NVIS) antenna. See page 63 in this issue and in July for Jacques d'Avignon's discussion of how NVIS can be applied as a means of short-range HF broadcasting.

It is interesting to note that most of our homebrew horizontal HF antennas are of this upwards-directed, NVIS variety. Even when we want to concentrate on DX reception we often build a NVIS antenna. Why? Because it is so difficult to mount a horizontal antenna the halfwave distance above the ground necessary to obtain good low-angle vertical radiation/reception patterning.

To mount a horizontal antenna a half wavelength in the air you would have to elevate it well over 100 feet at 4 MHz, and over 60 feet at 8 MHz. At 16 MHz it is only 30 feet, but even that is still too high for many of us to hoist our antennas. So, whether we like it or not, our horizontal HF antennas are usually NVIS antennas with the consequent small amount of low-angle vertical radiation/reception patterning, and large amount of high-angle patterning. Such an antenna is excellent for relatively close-in reception. Although it is definitely not a DX antenna, it does have some relatively low-angle patterning, and it will still pull in a bit of DX.

Let's Make a "Straight Up" Beam

1. Consult fig. 1 frequently in constructing this antenna.
2. This antenna consists of an ordinary halfwave dipole with a counterpoise directly below it. Obtain the total length of either of these elements from the formulas below.

$$\begin{aligned} \text{Length (feet)} &= 468 / \text{frequency in MHz} \\ \text{Length (meters)} &= 142 / \text{frequency in MHz} \end{aligned}$$

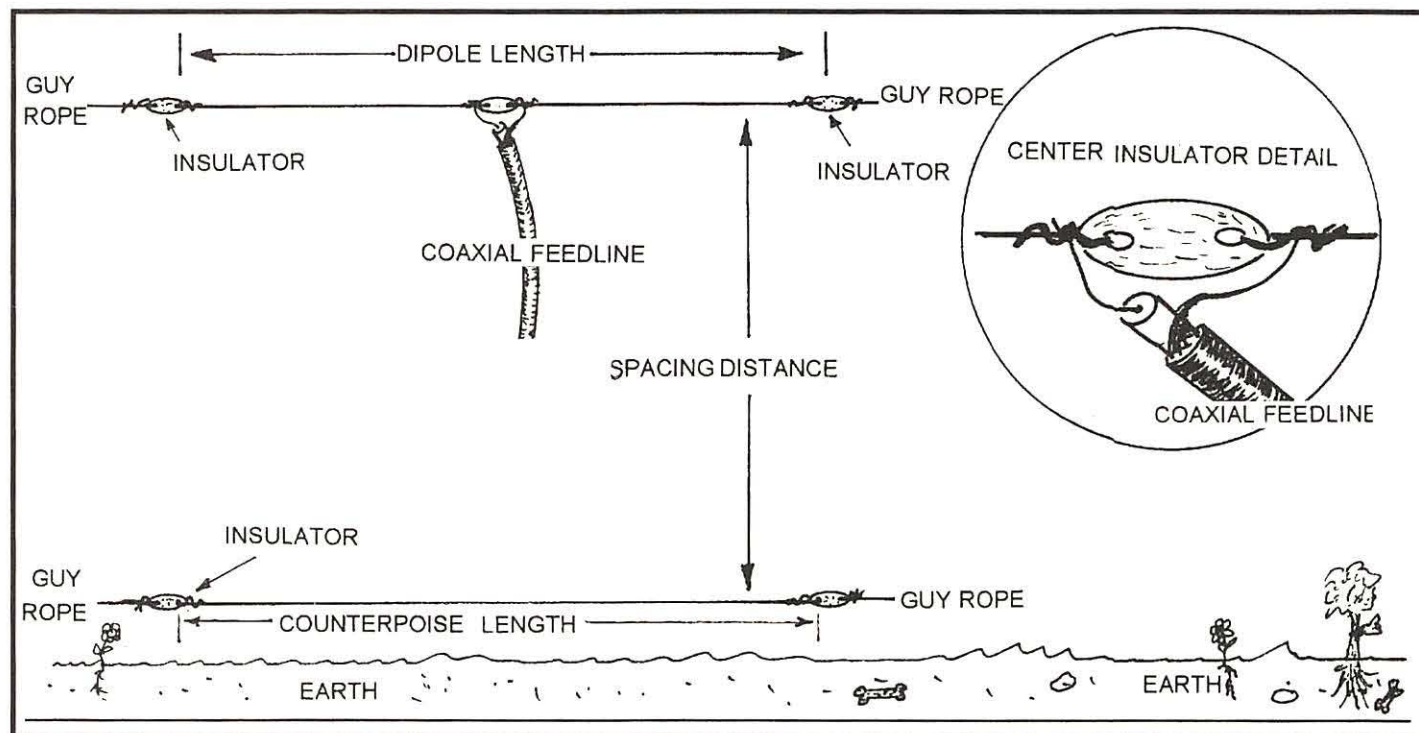


FIGURE 1. A dipole antenna with a counterpoise.

For example, at 10 MHz the total antenna length is 46.8 feet

3. Use just about any kind of wire that's strong enough to last. Cut one wire to the formula length plus enough extra wire to wrap through four of your insulator holes. Cut a second formula length plus enough extra wire for two insulator holes; this second wire will be the counterpoise.
4. For both wires make sure the wire ends are clean for soldering, and insert the ends into insulators as in fig. 1. Solder the wires in place. The counterpoise is now complete.
5. Cut the dipole element in half and attach its center insulator in the same fashion as the end insulators. Then attach a length of low-impedance (50 ohm, 75 ohm) coaxial cable at the antenna center insulator. The center coax conductor attaches to one wire and the coax shield to the other. Seal the coax end against weather with coax sealant.
6. Stretch the counterpoise directly beneath where the dipole element will be. It should be close to the ground, but not close enough to accidentally touch the ground or vegetation.
7. Stretch the dipole anywhere from 1/10 to 1/4 wavelength directly above the counterpoise. The closer spacing should be best for the closest stations.

In air a full wavelength (feet) = $984/\text{frequency in MHz}$

In air a full wavelength (meters) = $300/\text{frequency in MHz}$

8. To protect against lightning-induced damage, remember to disconnect and ground the antenna lead-in when the antenna is not in use. Never use an outside antenna during weather likely to produce lightning.

Because its nulls are rather shallow a dipole mounted this close to the ground is relatively nondirectional. You should get good all-around reception of stations up to perhaps 1000 miles away. And, despite its predominately high-angle patterning, you'll copy some DX signals, too.

RADIO RIDDLES

Last Month:

We discussed that "the groundplane antenna has a quarterwave vertical element, and two or more quarterwave radials. As you know, the radials extend outward symmetrically from the base of the vertical element as spokes extend from the hub of a wheel." Then I asked, "When this antenna is transmitting what does the radiation from the radials con-

tribute to the signal strength as received by a distant receiving antenna?" Your hint was to remember the canceling effect of currents which flow in opposite directions within the same wire.

Let's imagine that we look at a groundplane antenna from a distance. Let's also imagine that we can see the current as it leaves the feedpoint and moves out along the radials. The radials are perpendicular to the vertical element. We would "see" current flowing from the feedpoint toward the right on the right hand radial, and from the feedpoint toward the left on the left hand radial.

Because the radials are close together their fields would appear to come essentially from a single source when viewed from a distant receiving antenna. Remember that radio waves and light waves are both electromagnetic waves, and that they act similarly. Thus, this failure of the distant receiving antenna to sense the waves separately is similar to you being unable to visually distinguish between two distant lines which you view from a great distance.

Because these fields essentially overlap, their effect will combine, and the receiving antenna will "see" only this combined field. Because the currents inducing these fields flowed in opposite directions on the two radials the fields will be of opposite polarity, and will cancel each other. The combined result would be no signal at all!

Thus the radials contribute no signal strength at the distant receiving antenna; the vertical element is the sole source of received signal strength. Note, however, that this discussion has described the classic groundplane with radials perpendicular to the vertical element. If we use drooping elements the cancellation is less than perfect.

As the amount of drooping is increased, the radials increasingly contribute to the received signal at the distant antenna until, when drooped straight down, they contribute equally with the top vertical element. As a matter of fact, the antenna is then no longer a groundplane antenna, but a vertical dipole! Oh well!

This Month:

Consider the counterpoise beam described above. Imagine that we swing the counterpoise up in the air parallel to the dipole such that its height was the same as the dipole. Space the dipole and counterpoise 1/4 wavelength apart.

By the way, the counterpoise has a new name when used in this new position; so does the antenna. What are those names, and how have we changed the antenna's performance

by our change in the counterpoise's position?

You'll find an answer for this month's riddle, and much more, in next month's issue of *Monitoring Times*. Til then Peace, DX, and 73.

Note on advertisement below: As of 4/26/94 it became unlawful to market cellular-capable receivers in the US. Radio Progressive assures us that it will give a full refund and hold customers harmless from shipping expenses if a purchased unit is returned to the vendor by US Customs.

SCANNERS AND RECEIVERS

* Full Coverage Receivers *

ICOM	AOR	YUPITER
ICR1 100 KHz to 1300 MHz	AR2700 500 KHz to 1300 MHz	MVT7000 8 MHz to 1300 MHz
ICR100 100 KHz to 1856 MHz	AR8000 500 KHz to 1900 MHz	MVT7100 530 KHz to 1650 MHz
ICR7100 25 MHz to 2000 MHz	AR3000A 100 KHz to 2036 MHz	MVT8000 8 MHz to 1300 MHz
ICR9000 100 KHz to 2000 MHz	AR3030 30 KHz to 30 MHz	
ICR7000 25 MHz to 1000 MHz 1025 MHz to 2000 MHz		

Radio Progressive Int'l Inc.
4194 T.C. Hwy. St. Laurent, Quebec, CAN. H4S 1M3
Tel.: (514) 336-2423
Fax.: (514) 336-5929

The professional weather station for people who care about the weather.

Connects to Packet Radiol

Davis Instruments has a complete line of weather stations affordable enough for home and hobby use. Connect the station to packet radio using shareware program available on Davis' BBS.

Features Include:

- Inside & Outside Temps
- Wind Speed & Direction
- Barometer
- Time & Date
- Inside Humidity
- Wind Chill
- Alarms
- Highs & Lows
- Rainfall Option
- Instant Metric Conversion
- Outside Hum. & Dew Point Option
- Optional PC Interface

1-800-678-3669

or visit us at www.davisnet.com

M-F 7 a.m. to 5:30 p.m. Pacific Time • MT680E
FAX 1-510-670-0589 • M/C and VISA
One-year warranty • 30-day money-back guarantee

DAVIS INSTRUMENTS
3465 Diablo Ave., Hayward, CA 94545

SPECIAL EVENT CALENDAR

CLUB CIRCUIT

August 1-3	Austin, TX	South Texas Section Conv / Joe Makeever, W5HS, 512-345-0800
August 2	Mt. Shasta, CA	Mount Shasta ARC / Rich Zanni, KJ6RA, 916-926-1237
August 2	St Romuald, Can	Hamfest of St Romuald, Canada / Francois Berube, VA2RC, 418-523-4476
August 2	Ellijay, GA	Ellijay ARS / Dot Beam, K4PPS, 706-276-6660
August 2	Watkinsville, GA	Athens Radio Club / Rodney Couch, KE4ANM, 706-353-2773
August 2	Carlinville, IL	Macoupin County ARC / Tim Jones, KA9VIV, 217-627-2355
August 2	Quincy, IL	Western Illinois ARC / Jim Funk, N9JF, 217-336-4191
August 2	Houghton, MI	Copper Country RAA / 1997 Upper Peninsula Amateur Radio Convention / Roland Burgan, KB8XI, 906-482-2403 / Location: City of Houghton's Dee Stadium, located on the downtown waterfront. 9Am.
August 2	Oscoda, MI	ICARE / Ray Knuth, KB8ZYY, 517-739-2896 or 517-739-3129
August 2	Springfield, MO	Missouri State Convention / Karen Thorpe, N0TDW, 417-889-6775
August 2	Weedsport, NY	Auburn ARA / Joe Kahler, WA2NGX, 315-364-5135
August 2	High Point, NC	High Point ARC / Mark McMahan, KB4MFP, 910-887-3039
August 2	Columbus, OH	The Voice of Aladdin ARC / Jim Morton, KB8KPJ, 614-846-7790
August 2-3	Eureka, CA	Humboldt ARC / Wayne Carlson, KF6AAP, 707-668-4396
August 2-3	Jacksonville, FL	ARRL National Convention / Larry Filzen, WB4CGD, 904-272-0726
August 2-3	Spokane, WA	Eastern Washington Section Conv / Ronald R. Kimm, W7OPR, 509-924-2959
August 3	Livermore, CA	Livermore ARK / Noel Anklam, KC6QZK, 510-447-3857
August 3	Peotone, IL	Hamfesters Radio Club / Dave Brasel, NF9N, 708-448-0580
August 3	Angola, IN	Land of Lakes Hamfest / Sharon Brown, WD9DSP, 219-475-5897
August 3	Amana, IA	Cedar Valley ARC / Wayne Kolosik, K10FE, 319-393-4224
August 3	Port Huron, MI	E Michigan ARC / Robert Herbert, KB8WMW, 810-364-7874, 810-982-1561
August 3	Randolph, OH	Portage ARC / Joanne Solak, KJ3Q, 330-274-8240
August 3	Apollo, PA	Skyview Radio Society / Bob Livrone, N3WAV, 412-339-9607
August 3	Berryville, VA	Shenandoah Valley ARC / Irvin Barb, W4DHU, 540-955-1745
August 3	Marshfield, WI	Marshfield Area ARS / Guy Boucher, KF9XX, 715-384-4323
August 9	Valparaiso, IN	Porter County ARC / Rich Ard, N9QLQ, 219-762-0484
August 9	Dryden, NY	Tompkins County ARC / Ross Boyer, N2ISU, 607-844-4302
August 9	Lewistown, PA	Juniata Valley ARC / Richard Yingling, WB3COB, 717-242-1882
August 9	Tacoma, WA	Radio Club of Tacoma / Alan Hughes, KB7SVU, 206-840-4947
August 9	Huntington, WV	Tri-State ARA / Georgia Overby, KA8QME, 304-522-1811
August 9	Baraboo, WI	Yellow Thunder ARC / Bill Hommel, KA9QFJ, 608-356-8571
August 9-10	Shreveport, LA	Shreveport ARA / Dana Wicks, KJ5SU, 318-865-9430
August 10	Stickney, IL	DuPage ARC / Ed Weinstein, WD9AYR, 630-985-9256
August 10	Frankfort, KY	Bluegrass ARS / Central Kentucky ARRL Hamfest / Bill DeVore, N4DIT, 606-273-8345 / Location: Western Hills High School, Exit 53 off I-64. Admission \$6.
August 10	Jackson, MI	Michigan State Convention / Terry Osborn, K8SMC, 517-784-2398
August 10	St. Cloud, MN	St. Cloud ARC / Charlie Grafft, N0SDL, 320-251-8008
August 10	Redmond, OR	Central Oregon DX Club / Bill Sawders, K7ZM, 541-389-6258
August 16	Madison, WI	4th Annual Madison Area Get-Together for DXers and Radio Enthusiasts / Tim Noonan, 608-271-0458, E-mail: dxerak@aol.com
August 16	Fair Oaks, CA	River City AR Comm Society / Lewis Tuttle, AC6QP, 916-771-2336
August 16	Oakland, NJ	Hoosier Lakes RC / Loren Melton, WB9OST, 219-858-9374
August 16	Roanoke, VA	Ramapo Mountain ARC / Ken Hansen, KB2SSE, 201-962-4632
August 16	Longview, WA	Roanoke Valley ARC / Ben Vluc, AD4UR, 540-890-6782
August 16-17	Huntsville, AL	Lower Columbia ARA / 6th Annual Ham Radio, Computer, & Electronic Equipment Swap Meet / Bob Morehouse, KB7ADQ, 360-425-6076 / Location: Cowlitz Co. Fairgrounds. Talk-in 147.26+, pl 114.8. 9am - 3pm, admission \$3.
August 16-17	York, PA	Alabama Section Convention / Don Tunstall, W4NO, 205-534-7175
August 17	Goleta, CA	York, Keystone, Hilltop Clubs / Robert Moore, N3KDS, 717-252-1694
August 17	Golden, CO	Santa Barbara ARC / Rhona Anderson, KE6FKA, 805-969-9178
August 17	Georgetown, DE	Colorado State Convention / Guy Reed, W5GR, 303-674-5389
August 17	Lafayette, IN	Sussex ARA & DELMARVA / Thomas McDugall, N3JRB, 302-856-2938
August 17	Salina, KS	Tippencanoe ARA / James Canarecci, WA9TGO, 317-474-6570
August 17	Cambridge, MA	Central Kansas ARC / Ron Tremblay, WA0PSF, 913-827-8149
August 17	Broadway, OH	MIT RS & Harvard Wireless / Steve Finberg, W1GSL, 617-253-3776
August 17	Paulding, OH	Union County ARC / Gene Moore, N8YRF, 513-246-5943
August 17	Warren, OH	Paulding County AR Group / Jerry Rhodes, KB8MAF, 419-399-4507
August 22-23	New Orleans, LA	Warren ARA / Al Van Slyke, N8IKX, 330-889-3378
August 22-24	Bismarck, ND	New Orleans International DX Conv / Silvano Amenta, KB5GL, 504-454-6184
August 23	Grand Junction, CO	Dakota Division Convention / Tim Rasset, N0SDB, 701-663-6620
August 23	Gardner, MA	Western Colorado ARC / Bruce Chambers, KB0SNF, 970-434-7439
August 23	Bridgewater, NJ	Mohawk ARC / John Dould, WF1L, 508-249-5905
August 23	Chaffee, NY	Somerset County ARS / SCARS Hamfest / Pat Reagan, N2CQM, 908-873-3394 / Location: Somerset County 4H Center, Milltown Road. Talk-in 448.175-PL 141.3, 147.135+ PL 151.4
August 23	Weston, WV	Pioneer Radio Operators Society / Michael Wrona, KB2TDN, 716-675-2071
August 23	Rhineland, WI	West Virginia State Convention / Dave Ramezan, KA8ZXP, 304-462-7560
August 23-24	Woodland Park, CO	Rhineland & Northwoods ARES / Mary Berger, N59Q, 715-362-9296
August 23-24	Albuquerque, NM	Mountain ARC / Don Chamberlain, AA0NW, 719-687-3692
August 24	Enfield, CT	Duke City Hamfest / Richie Allen, KC5NZR, 505-242-0208
August 24	Danville, IL	VHF-UHF Conference Swap 'n' Sell / Mark Casey, N1LZC, 413-566-2445
August 24	Woodstock, IL	Vermilion County ARA / Gary S. Denison, KA9SKS, 217-759-7389
August 24	Adams, MA	Tri-County Radio Group / Bob Grosse, N9KXG, E-mail: tcrgr@hotmail.com
August 24	Corunna, MI	Northern Berkshire ARC / Joel Miller, N1WCF, 413-442-2609
August 24	St. Charles, MO	Bay, Genesee Co., Lapeer, Shiawassee, Mid-Mich Wireless / Jan LaBrenz, N8NSE, 517-893-3475
August 24	Mullica Hill, NJ	St. Charles ARC / Scott Schultz, AA0ZS, 314-928-7267
August 24	Yonkers, NY	Gloucester County ARC / John Lloyd, KA2EZN, 609-358-1285
August 30	Alamogordo, NM	Yonkers ARC / John Costa, WB2AUL, 914-969-6548
August 30	Hayward, WI	Alamogordo ARC / Bill Leehan, N5SUM, 505-437-9781
August 30-31	Shelby, NC	Namekagon Valley Wireless Assn. / Mary Lindberg, KB9LFF, 715-378-2368
August 31	Dubuque, IA	Shelby ARC / June Melvin, WA4JNJ, 704-739-2583
		G River, IA Antique, Tri-State Computer / Jerry Ehlers, N0NLU, 319-583-1060

Send announcements of events or club information to: Editor, Monitoring Times, P.O. Box 98, Brasstown, NC 28902-0098. Fax 704-837-2216; e-mail mteditor@grove.net. See MT's homepage on www.grove.net for complete event and club listings.

North American Club Listings N - T

National Radio Club: Paul Swearingen, Publisher, P.O. Box 5711, Topeka, KS 66605-0711, (913)266-5707; <http://wcoil.com/~gnbc/> Worldwide; AM DXing. DX News 30 times yearly, sample for a first class stamp. Annual Labor Day convention.

North American SW Assoc: Bill Oliver, 45 Wildflower Lane, Levittown, PA 19057, (215) 945-0543 mailto:naswa1@aol.com. Worldwide; Shortwave broadcast only. The NASWA Journal. Regional meetings.

Ontario DX Association: Joe Robinson, General Mgr., P.O. Box 161, Station A, Willowdale, Ontario M2N 5S8, Canada; Internet 70400.2660@compuserve.com; (416) 293-8919 voice & fax, (416) 444-3526 DX-Change information svce; (905) 841-6490 BBS. Predominantly Province of Ontario; All bands. DX Ontario. Meet 3rd Wednesdays, Toronto

Pacific NW/BC DX Club: Bruce Portzer, 6546 19th Ave NE, Seattle, WA 98115. Pacific NW and BC Canada. DXing all bands. \$9 US, \$10 Canada. PNBCDXC Newsletter. Irregular meetings.

Palm Beach County Scanner Group (PBCSG): Brian Cathcart, 4050 Edgewood Drive, Coconut Creek, FL 33066-1835; scannerdude@juno.com

Pitt Co SW/Scanner Listeners Club: L. Neal Sumrell, P.O. Box 1818, Winterville, NC 28590-1818. Eastern NC; All bands. The DX Listener. Irregular meetings.

Puna DX Club: Jerry Witham, P.O. Box 596, Keaau, HI 96749, (808) 982- 9444; Puna, HI; SW and MW. Meet 1st Tuesdays. No dues.

Radio Monitors of Maryland: Ron Bruckman, P.O. Box 394, Hampstead, MD 21074. Maryland, (410) 239-7366; VHF/UHF/HF utilities. Radio Monitors Newsletter of MD. <http://http://arrowweb.com/RMM> Meets irregularly.

Regional Communications Network (RCN): Jay Delgado, Box 83-M, Carlstadt, NJ 07072-0083. A hobbyist group dedicated to information and resources on rf-telecommunications technology and broadcasting worldwide. #10 SASE for info.

Rocky Mountain Radio Listeners: Mike Curta, P.O. Box 470776, Aurora, CO 80047-0776. Metro Denver, Colorado. All bands. Meets monthly 2nd or 3rd Sundays 1- 4pm, Aurora Central Library.

Sandy River SW Radio DXers Assoc: Duncan or Brenda Steele, R.R. 1, P.O. Box 1560, Norridgewock, ME 04957. Worldwide. The QSL - irregular. No dues.

Scanning Wisconsin: Ken Bitter, Dept. MT, S. 67 W. 17912 Pearl Dr., Muskego, WI 53150-9608, (414) 679-9442. Wisconsin. VHF/UHF. Scanning Wisconsin (\$2 for sample)

Signal Surfer DX Club: Darcy Jabs, RR2, Burns Lake, BC, Canada, V0J 1E0; (250) 694-3760, djabs@awinc.com. Canada and worldwide. www2.awinc.com/users/djabs/ MW and SW DXing. Meets Thursdays. Free helpful info; Canadians send three 45-cent stamps, all others send a dollar bill or two IRCs.

Southern California Area DXers (S.C.A.D.S.): Don R. Schmidt, 3809 Rose Ave., Long Beach, CA 90807-4334, (310) 424-4634. California area; AM, FM, TV, scanner and shortwave broadcasting.

Susquehanna Co Scanner Club: Alan D. Grick, P.O. Box 23, Prospect St., Montrose, PA 18801-0023. PA area; Scanning. Meets irregularly.

Toledo Area Radio Enthusiasts: Ernie Dellinger, N8PFA, 6629 Sue Lane, Maumee, OH 43537. NW Ohio and SE Michigan; Shortwave, scanning, amateur. Meets 3rd Thursdays 7pm Holland Big Boy.

Triangle Area Scanner/SW Listening Group: Curt Phillips, KD4YU, P.O. Box 28587, Raleigh, NC 27611. Central NC.

World-Class SW Performance...

Introducing a New Under \$1,000
Dynamic Duo from JRC and Grove!

**New and
Improved Grove
SP-200B!**



Grove's new and improved SP-200B Sound Enhancer is really six products in one. Just look at its many features and capabilities:

- Top quality speaker; also features headphone jack
- Hand-crafted hardwood cabinet
- Adjustable notch/peak filter (30 dB or greater, 0.3-6 kHz)
- Recorder activator
- Audio amplifier (2.5 W @ 10% THD, 8 ohms)
- Audio activated squelch
- Noise limiter

Why pay over \$400 for separate audio components for your listening post—such as a speaker, adjustable notch/peak filter, audio amplifier, bass and treble equalizers, audio squelch, recorder activator and noise limiter—when you can have them all in one attractively styled solid oak cabinet! This quality accessory is guaranteed to improve reception on any receiver, scanner or transceiver.

Peak desired signals while reducing or even eliminating interference. Ideal for voice, music, CW or data. Equipped with stereo-mono headphone jack for privacy. Powered by 12VDC@800 mA. AC adapter not included (see below).

The cabinet is hand-crafted in the mountains of North Carolina. Textured metal front panel resists fingerprints.

ORDER SPK 13 (SP-200B Sound Enhancer)

\$199⁹⁵

Please add \$8 2nd Day UPS;
\$10 US Priority Mail; \$14 Canadian
UPS; or \$12.50 Canadian APP shipping

ACCESSORIES:

PWR04 12 VDC/800 mA Power Supply \$14.95

ORDER RCV 20 (JRC NRD-345)

\$799⁹⁵*

Please add \$17 2nd Day UPS;
\$29 US Priority Mail; \$26
Canadian UPS; or \$35.50
Canadian APP shipping

**Both products are now shipping!
Place your order today!**

*The SP-200B is guaranteed
to improve reception on any
receiver, scanner or
transceiver!*

**New JRC
NRD-345
Receiver!**



Known for their luxury, high-performance receivers, Japan Radio company (JRC) has just released a high quality, double conversion receiver at a low, competitive price! The new NRD-345 offers wide frequency coverage (100 kHz-30 MHz), multimode reception (AM, synch. AM, SSB), sharp selectivity (2/4 kHz), high sensitivity (0.3 microvolts), wide dynamic range (100 dB), strong audio (1 watt), dual VFOs, scannable memory (100 channels) with channel lockout, computer control (RS232C), dual clock timer (12/24 hour), precision tuning (5/100 Hz., 1/10 kHz steps), and adjustable noise blanker.

Additional features include selectable AGC timing, 20 dB attenuator, adjustable tone control, backlit S meter, large backlit LCD display, and dual-voltage (12 VDC / 120 VAC) power supply. See specifications below.

Frequency Range: 100 kHz-30 MHz

Keypad Entry: Yes

Tuning Steps: 5/100 Hz; 1/10 kHz

Display: Backlit LCD

Recommended use: General purpose SW and utilities

Receiving modes: AM, AM synch, USB, LSB

Memory: 100 channels

Scan: Yes

Clock: 12/24 hr. clock/timer

Audio Output Power 1 Watt

Record Audio Output: Yes

Signal Strength Indicator: LCD bargraph

Computer Interface: RS-232C

Conversion Scheme: Double up-conversion

Sensitivity: 0.3 uv

Selectable Attenuator 20 dB

IF Selectivity: (-6/-60 dB) 4/10 kHz wide, 2/6 kHz narrow

Image Rejection -70dB

Selectable AGC: Off/fast/slow

Dynamic Range: 100 dB

Noise Blanker/Limiter: Adjustable

Tone Control: Yes

Antenna Connector: SO-239 and 600 ohm

Dimensions: 10"W/4"H/9"D

Weight: 7.7 lbs.

Power Requirements: 12 VDC/120 VAC

Warranty: One year

Accessories Included: AC adaptor

**Buy them Both for
Under \$1,000!**

GROVE

Grove Enterprises, Inc.

7540 Highway 64 West

Brasstown, N.C. 28902

(800) 438-8155 US & Can.

(704) 837-9200

Fax (704) 837-2216

e-mail: order@grove.net

World Wide Web: www.grove.net

* Price could be much less with your
equipment trade-in (call!)

THOSE PESKY "D" CONNECTORS

In my May *Closing Comments*, I tried to flaunt my (imaginary) exhaustive knowledge by incorrectly identifying all RS-232C computer connectors as type DB. Fortunately for my readers, Minor Cross of Corvallis, Oregon, *really* knew the answer. It seems that the second letter denotes the pin count: DA (15 pins), DB (25 pins), DC (37 pins), DD (50 pins), and DE (9 pins). Thanks, Minor.

Q. *Some time ago I remember seeing add-on commercial blockers for TVs. How do they work and where can I get one? (John Wallace, Sr., Syracuse, NY)*

A. Succinctly, they don't work and you can't get one. There are no standard signals sent by networks that could alert any sort of detector that a commercial break is next, or when it is over. That is why you don't see such a device advertised; if they worked, everyone would want one!

The only standard cue is that there is usually a "dip to black," the screen goes dark just before and just after the commercial break;

but that is just unused time, and is not a reliable cue for an electronic device.

Q. *Can the Grove (GRE) 800 MHz converter be used on a Bearcat 20/20 scanner? (Chris Fox, Stevens Point, WI)*

A. The 800 MHz down-converter simply shifts the entire block of 800-900 MHz signals it receives 400 MHz lower in frequency; thus, 806-900 MHz becomes receivable as 406-500 MHz on the host scanner. If your scanner receives only a portion of that 400-500 MHz range, then the amount of 800-900 MHz band receivable is proportionately reduced.

When using such a converter, no other frequency ranges are receivable, only the down-converted 800 MHz band, and tuning step increments will be whatever the host scanner uses in its 400-500 MHz range.

Q. *I recently moved to a large farm; if you had unlimited space for an SWL antenna, what would be your dream system? (A.J. Marhofke)*

A. Assuming I had unlimited space, but not

unlimited cash, I'd be perfectly satisfied with a rather conservative outlay of both wire and money. A couple of Beverage antennas running east/west and north/south would start. For VLF, where signals are sparse and weak, I'd like an active antenna. A 25 ft. vertical for general purpose listening would finish the installation. You might try a rotatable loop for nulling interference and for direction finding.

Keep in mind that atmospheric noise is the limiting factor below roughly 50 MHz; once you have enough antenna to overcome your receiver's own internally-generated circuit noise, a larger antenna will only bring in more noise along with the signal, the same as simply turning up the volume control on a smaller antenna.

For maximizing signal strengths, go for directivity, not size, and stay away from nearby electrical wiring and large, metallic structures.

Q. *I hear medevac helicopters on 155.220 MHz, the same frequency as school buses in my area; how come? (Robert Compton, Mertztown, PA).*

A. Even though they are aircraft, air ambu-

Bob's Tip of the Month

Simple Mediumwave Broadcaster Overload Cure

Many shortwave listeners using outside antennas are plagued by interference from strong, local AM broadcasters in the 540-1700 kHz medium wave band. The problem is especially compounded by the use of a long, random-wire antenna. *MT* reader Jim Weber of Colton, California, has a simple fix.

Jim simply inserts a 365 pF variable capacitor in line (series) with the antenna. Simply stated, the capacitor is adjusted to provide low impedance to high frequency signals while presenting higher impedance to lower

frequency signals; thus it is adjusted to reduce medium wave signals while allowing shortwave signals to come through full strength.

For convenience, Jim mounted his tuning capacitor in a plastic (not metal) box since both the rotor and stator are "hot" (ungrounded). If a metal box is preferred, the capacitor must be insulated from the box. A knob on the shaft makes tuning that much easier.

If your junkbox doesn't yield an air variable tuning capacitor, flea-market AM/FM radios are readily available for a few dollars and offer abundant parts—including their tuning capacitors.

BC-3000XLT Keyboard Trick

One of the most popular topics in this column is simple keyboard tricks for scanners, and the highly-successful BC-3000XLT is no exception. This latest contribution comes from reader Johnny DeVito of Belmont, Mas-

sachusetts, who discovered the meaning of "On Dir" which is displayed briefly when the SCAN key is held down while switching the power on (see *MT*, April 1995 for a complete list).

By pressing the SFT (shift) key followed by the LIMIT/down arrow key, the direction of scan, from lowest to highest channel, now reverses to scanning from highest to lowest channel, as indicated by the small arrow that appears over the frequency display.

To restore the normal lower to upper direction, simply press the SFT key followed by the HOLD/up arrow key.

Not only does this simple keyboard routine reverse the memory channel scan order, but also the frequency autosort direction. This should be of help in manually following Motorola trunking communications which step from higher to lower frequencies as they switch through their frequency pool.

Thanks, Johnny, for your interesting contribution. Other readers who make similar discoveries are invited to share these with fellow hobbyists.

lances may be licensed to communicate with ground medical personnel. School buses are assignable as well under Part 90.43. Special Emergency Medical Services, of the FCC Rules and Regulations.

Q. I have several pieces of equipment powered by AC wall adaptors. Can I plug them all into a switched power strip and possibly reduce their failure from remaining plugged into AC wall sockets all the time? Will the surge of switching them on with the power strip harm any of the equipment? (Gary Otteson)

A. Keeping them switched off while not in use is a good idea; many "wall warts" meet minimal design criteria and are vulnerable to failure from overheating. No, switching on an AC adaptor will not cause a power surge harmful to your equipment; the internal filter capacitors do a good job absorbing that brief voltage spike.

Q. Are there any fixes to improve the audio on the BC-235XLT? (Chris Fix, Stevens Point, WI)

Questions or tips sent to "Ask Bob," c/o MT are printed in this column as space permits. If you desire a prompt, personal reply, mail your questions along with a self-addressed stamped envelope (no telephone calls, please) in care of MT, or e-mail to bgrove@grove.net. (Please include your name and address.) The current "Ask Bob" is now online at our WWW site: www.grove.net

A. Nothing published, but any audio circuit can be altered. Audio quality is a matter of personal preference, and each generation of a manufacturer's scanners sound different from the previous one.

For the electronically adept, bass can be increased by increasing the amount of series capacitance in the audio amplifier (between stages, between the amplifier and speaker); or by reducing the treble by placing a bypass capacitor from any audio point to ground. Conversely, treble can be increased at the expense of bass—making series capacitances smaller, and reducing the value of bypass capacitors between the audio circuit and ground.

Q. The Radio Shack discone is advertised to cover 25-1300 MHz; is it credible over this range? (Kim Ballweg, W. Seattle, WA)

A. No. Even a paper clip will pick up some signals on virtually any frequency range. The best-designed discones are good over roughly an 8:1 frequency range, top to bottom frequency. That would mean that the Radio Shack discone, even if ideally designed (it's not), should be most effective from 25-200 MHz, or else from 162-1300 MHz using their top and bottom frequency claims.

Note that even Radio Shack's own ad recommends their discone be used for transmitting only in the amateur 144-1296 MHz bands, but if it were suitable down to 25 MHz, they would have added the amateur 50-54, 28-29.7, and even the CB 27 MHz bands.

Discones are highly overrated; they were designed during World War II to communicate with military aircraft in the 118-136 and 225-400 MHz bands—a wide frequency coverage requiring constant-impedance antennas for matching their transmitters. But discones have no gain, and their upward angle of radiation ("takeoff angle") on some frequencies is great for working airplanes from the ground, but may not be suitable for ground wave coverage.

Some of the better commercial discones like the Diamond and ICOM units add a vertical element to help enhance lower frequencies; but not Radio Shack. Our tests show that all scanner discones are poor performers below about 100 MHz, thus providing an 8:1 frequency coverage of roughly 100-800 MHz or higher since we aren't really interested in impedance matching for receiving purposes. Those with the vertical element provide an additional peak around 50 MHz to help with low band reception.

INDEX OF ADVERTISERS

Alpha Delta	93
Antique Radio Classified	85
Arcron Zeit	69
Atlantic Ham Radio	73
Bandercom	77
Communications Electronics	3, 67
Computer Aided Technologies ...	90, 91
CSP Technologies	73
Davis Instruments	97
Delta Research	77
Drake, R.L. Company	25
DX Computing	53
Erie Aviation	65
Fineware	9
Future Scanning Systems	71
Glenn Hauser	39
Grove Enterprises	5, 16, 29, 48, 99
<i>plus special 16-page Buyer's Guide</i>	
ICOM	Cover III
Index Publishing	33
Irdial Discs	17
Jacques d'Avignon	47
Kevin Carey	66
KIWA Electronics	11, 83
Lentini Communications	33
Monitoring Times	103
Motron Electronics	21
National Scanning Report	31
OptoElectronics	Cover II, IV
Palomar Engineering	75
PW Publishing	73
Radiomap	95
Radio Progressive	97
Ramsey Electronics	19
R.C. Distributing	23
R.D.I. White Papers	93
Satellite Times	103
Scanner Master	77
SGC Inc.	27
Signal Intelligence	33
Skyvision	81
Universal Radio	83
Viking International	7
WINRADIO	13
Worldcom Technology	85

Do You Have Questions? Bob Has Answers!



Get the answers from the expert on scanner and shortwave monitoring. Bob Grove's *Scanner and Shortwave Answer Book* is a great addition to your reference library.

Order BOK5
\$12.95

Plus \$2 Bookrate or
\$4.50 UPS

Grove Enterprises
7540 Hwy. 64 W.
Brasstown, N.C. 28902
1-800-438-8155

STOCK EXCHANGE

Monitoring Times assumes no responsibility for misrepresented merchandise.

Ads for Stock Exchange must be received 45 days prior to publication date. All ads must be paid in advance to *Monitoring Times*.

Ad copy must be typed for legibility.

NON-COMMERCIAL SUBSCRIBER RATES:

\$.25 per word — *Subscribers only!*

All merchandise must be personal and radio-related.

COMMERCIAL, NON-SUBSCRIBER, AND MULTIPLE SALES RATES: \$1.00 per word. Commercial line ads printed in bold type.

1-3/4" SQUARE DISPLAY AD: \$50 per issue if camera-ready copy or, \$85 if copy to be typeset. Photo-reduction \$5 additional charge. For more information on commercial ads, contact Beth Leinbach, 704-389-4007.

NEW BLACK BOX ANTENNAS! Tunable rectangular loops with twice the output of the originals. Black Box Antenna, 14624 Deon Drive, Sonora, CA 95370. (209) 533-2865.

LONGWAVE PRODUCTS AND KITS. Send 32 Cent stamp to: Curry Communications, PO Box 1884, Burbank, CA 91507-1884. Visit us at: <http://www.fix.net/~jparker/currycom.htm>

POOR RECEPTION on your A.M. Radio? Our signal booster will help. Guaranteed! Version 1701 tunes 530-1700 KHz. \$48 + \$5.50 S&H. If not satisfied within 30 days, we'll refund your money, less S&H charge. Fala Electronics-6, P.O. Box 1376, Milwaukee, WI 53201-1376. (414) 671-5203.

GESUPERADIO III, custom designed with up to four noise-free SCA channels. Performance guaranteed. Credit Card orders accepted. (800) 944-0630.

FM MICRO BROADCASTING: Transmit many miles. 88-108 MHz. PLL. Kit or assembled. Mono/stereo, 1-100 watts. We ship worldwide from Canada. Call (250) 642-2859. R. Scott Communications.

www.radiofinder.com -- vintage amateur & military shortwave equipment. finder@radiofinder.com (313) 454-1890.

RC-740X, band expansion for KENWOOD 741/742 series, ScannerWEAR WINDOWS software for ICOM, AOR, OPTO receivers. See all at <http://www.radioscan.com> R.C.S.I. M-F 9-4 PST, 1-800-560-7234.

ELECTRONIC COMPONENTS-KITS Catalog \$1.00, on-line catalog <http://www.fix.net/dans.html>. Dan's Small Parts and Kits, Box 3634, Missoula, MT 59806.

THE COMMUNICATORS HANDBOOK. A reference guide for the professional engineer or Radio DX'er with a list of FREE catalogs and much, much more!! To order, send \$9.98 U.S. check/MO, Canada \$13.50 int'l postal MO TO: S. Crawford, PO Box 83, Riverdale, NY 10463. Fast FREE Shipping!

ELECTRONIC and technical military manuals for sale. Basic electricity, basic electronics, antenna theory and mechanical books. Write or call for listing: Art's Book World, Inc., 6822 22nd Avenue North, Suite 173, St. Petersburg, FL 33710. Call (813) 525-4880 or (888) 414-BOOK, e-mail: abw@ix.netcom.com, <http://artsbookworld.com>

TEST EQUIPMENT BONANZA! Free shipping! Bird 4411W wattmeter, like new; elements for 2-30, 144-520, 400-1000 MHz, leather case. Orig. cost \$1383 (order TIN75 \$569.95). Grove Enterprises, P.O. Box 98, Brasstown, NC 28902. 1-800-438-8155.

PRO-46 HANDHELD scanner, 100 channel, 29-956 MHz, cellular restored. New in the box. \$325.00. Call or fax Thomas at (513) 661-1234.

"RADIO STUFF SALE!" Magazines, bulletins, books, radio station items, some equipment. Send 2-stamp business size SASE or \$1 for list: G. Dexter, 213 Forest St., Lake Geneva, WI 53147.

RAMSEY SR-I shortwave receiver, like new in

cabinet. \$25.00. Howard (716) 838-2406.

YAESU FRG7, \$200. Quantum MW antenna, \$125. Sangean 606, \$100. All excellent, prices firm, includes shipping. Pete (205) 773-5505.

FOR SALE: McIntosh MR-78, "Simply the Best" FM tuner ever made, (MT July 93 p. 49), excellent, \$1090; Pioneer TX-9500II, \$175; TX-9100, \$125; WANTED: AOR AR-7030; (412) 243-1569.

WANTED: Mint Sony ICF-SW1, kit not necessary; Mint Zenith Y600L leather T/O, need not be working. Jeff Wayne, 61 Allendale Dr, North Haven, CT 06473, (203) 281-6038, wayne4@snet.net.

DRAKE R8 w/Alpha Delta Sloper, \$525. Sony 2010 w/Gilfer case and stand, \$225. Both mint, w/original boxes and manuals. Call David (717) 385-4241 evenings.

McKAY-DYMEK DR22 - 50kHz to 30MHz - \$290.00. MFJ-1278B, MFJ-1289 has res. enhancer - \$150.00 for both. MFJ-959B anttuner-preamp - \$25.00. (718) 205-4588.

YAESU FRG100 w/keyboard, manual: \$475 obo; (813) 393-5175.

FOR SALE: Radios, HF, VHF, and UHF receivers and accessories. Write for list at: Radios, 2706 Market Street, Youngstown, OH 44507-9188.

WANTED: Square four blade socket power connectors or power cords for old type Bearcat III or IV scanners. Gary Jones, PO Box 467, Buckeye Lake, OH 43008.

(Letters, continued from Page 4)

the best. You may hear 'CB' with the tuning capacitor all the way open and ship traffic with it closed. You will need lots of patience with this set, just like fishing, but when you land one it's always a prize. The secrets are to have the best phones you can, to be listening at the right time, to have a good antenna and to tune slowly.' — Good advice for whatever you're monitoring!"

Please don't write Ken requesting copies of these circuits and mods. He doesn't have the facilities to reproduce them, and you can do the same research he did through your public library.

In the adventurous spirit of the hobby, we hope you'll take the articles you find in *MT* and add to them through your own experimentation and experience. As David Mobley of Springfield, Oregon, says: "I wanted to take a minute to say how much I use the magazine for reference, even months down the road." (Or years, in the case of a great number of our readers.) Let us add to your collection with a slightly more complicated receiver construction project in this issue: a new and improved "Ocean Hopper" shortwave radio. Give this old favorite a try and add your own improvements!

Please note the addition of a brand new column — *Tracking the Trunks* — dedicated to those of you just embarking on this latest twist in scanning trunked systems. We are hoping readers without internet access will find it especially helpful. Let us hear from you (whether you've been hoarding *MTs* for months or for years) about what you find most or least useful to your hobby in the pages of *Monitoring Times*.

— Rachel Baughn
mteditor@grove.net

**Think of what
you could do
with this space...**

**It's painless, we promise.
Contact our advertising
manager, Beth Leinbach,
at 704-389-4007**

PC RAM CHIP UPGRADES

New Even Lower Prices!

Through a special distributor-direct arrangement, Grove can offer you high quality RAM expansion at **incredible savings!** These are the same PC RAM upgrade SIMMS (72-pin, double-sided, non-parity, gold contacts) which you might buy from the big mail order houses—but you save \$\$\$ when you purchase from us!



16MB\$141.95 (Order RAM16)
16 MB (EDO 60) ..\$141.95 (Order RAM 16E)

GROVE ENTERPRISES, INC.
1-800-438-8155; 704-837-9200

FAX 704-837-2216; 7540 Highway 64 West, Brasstown, NC 28902

Join The Club!

Open to hobbyists worldwide, the **CANADIAN INTERNATIONAL DX CLUB** is an active promoter of the radio hobby through its monthly newsletter and local chapters.

The Messenger is packed with general coverage information including the broadcast band, shortwave, utilities, scanning, amateur radio and more. Send \$2 for a sample bulletin and membership information to:

CIDX

79 Kipps St., Greenfield Park,
Quebec, CANADA J4V 3B1

World Scanner Report

10 issues per year for casual & expert radioists who are committed to rare achievement and excellence in the pursuit of VHF-UHF scanning.



Edited and published by Bill Cheek, author of *The Ultimate Scanner* and the *Scanner Modification Handbooks, Vols 1 & 2*. Offer for entire \$5. For subscription \$22. For 1 year \$40. For 2 years \$75. For 3 years \$105. For 4 years \$135. For 5 years \$165. For 6 years \$195. For 7 years \$225. For 8 years \$255. For 9 years \$285. For 10 years \$315. For 11 years \$345. For 12 years \$375. For 13 years \$405. For 14 years \$435. For 15 years \$465. For 16 years \$495. For 17 years \$525. For 18 years \$555. For 19 years \$585. For 20 years \$615. For 21 years \$645. For 22 years \$675. For 23 years \$705. For 24 years \$735. For 25 years \$765. For 26 years \$795. For 27 years \$825. For 28 years \$855. For 29 years \$885. For 30 years \$915. For 31 years \$945. For 32 years \$975. For 33 years \$1005. For 34 years \$1035. For 35 years \$1065. For 36 years \$1095. For 37 years \$1125. For 38 years \$1155. For 39 years \$1185. For 40 years \$1215. For 41 years \$1245. For 42 years \$1275. For 43 years \$1305. For 44 years \$1335. For 45 years \$1365. For 46 years \$1395. For 47 years \$1425. For 48 years \$1455. For 49 years \$1485. For 50 years \$1515. For 51 years \$1545. For 52 years \$1575. For 53 years \$1605. For 54 years \$1635. For 55 years \$1665. For 56 years \$1695. For 57 years \$1725. For 58 years \$1755. For 59 years \$1785. For 60 years \$1815. For 61 years \$1845. For 62 years \$1875. For 63 years \$1905. For 64 years \$1935. For 65 years \$1965. For 66 years \$1995. For 67 years \$2025. For 68 years \$2055. For 69 years \$2085. For 70 years \$2115. For 71 years \$2145. For 72 years \$2175. For 73 years \$2205. For 74 years \$2235. For 75 years \$2265. For 76 years \$2295. For 77 years \$2325. For 78 years \$2355. For 79 years \$2385. For 80 years \$2415. For 81 years \$2445. For 82 years \$2475. For 83 years \$2505. For 84 years \$2535. For 85 years \$2565. For 86 years \$2595. For 87 years \$2625. For 88 years \$2655. For 89 years \$2685. For 90 years \$2715. For 91 years \$2745. For 92 years \$2775. For 93 years \$2805. For 94 years \$2835. For 95 years \$2865. For 96 years \$2895. For 97 years \$2925. For 98 years \$2955. For 99 years \$2985. For 100 years \$3015. For 101 years \$3045. For 102 years \$3075. For 103 years \$3105. For 104 years \$3135. For 105 years \$3165. For 106 years \$3195. For 107 years \$3225. For 108 years \$3255. For 109 years \$3285. For 110 years \$3315. For 111 years \$3345. For 112 years \$3375. For 113 years \$3405. For 114 years \$3435. For 115 years \$3465. For 116 years \$3495. For 117 years \$3525. For 118 years \$3555. For 119 years \$3585. For 120 years \$3615. For 121 years \$3645. For 122 years \$3675. For 123 years \$3705. For 124 years \$3735. For 125 years \$3765. For 126 years \$3795. For 127 years \$3825. For 128 years \$3855. For 129 years \$3885. For 130 years \$3915. For 131 years \$3945. For 132 years \$3975. For 133 years \$4005. For 134 years \$4035. For 135 years \$4065. For 136 years \$4095. For 137 years \$4125. For 138 years \$4155. For 139 years \$4185. For 140 years \$4215. For 141 years \$4245. For 142 years \$4275. For 143 years \$4305. For 144 years \$4335. For 145 years \$4365. For 146 years \$4395. For 147 years \$4425. For 148 years \$4455. For 149 years \$4485. For 150 years \$4515. For 151 years \$4545. For 152 years \$4575. For 153 years \$4605. For 154 years \$4635. For 155 years \$4665. For 156 years \$4695. For 157 years \$4725. For 158 years \$4755. For 159 years \$4785. For 160 years \$4815. For 161 years \$4845. For 162 years \$4875. For 163 years \$4905. For 164 years \$4935. For 165 years \$4965. For 166 years \$4995. For 167 years \$5025. For 168 years \$5055. For 169 years \$5085. For 170 years \$5115. For 171 years \$5145. For 172 years \$5175. For 173 years \$5205. For 174 years \$5235. For 175 years \$5265. For 176 years \$5295. For 177 years \$5325. For 178 years \$5355. For 179 years \$5385. For 180 years \$5415. For 181 years \$5445. For 182 years \$5475. For 183 years \$5505. For 184 years \$5535. For 185 years \$5565. For 186 years \$5595. For 187 years \$5625. For 188 years \$5655. For 189 years \$5685. For 190 years \$5715. For 191 years \$5745. For 192 years \$5775. For 193 years \$5805. For 194 years \$5835. For 195 years \$5865. For 196 years \$5895. For 197 years \$5925. For 198 years \$5955. For 199 years \$5985. For 200 years \$6015. For 201 years \$6045. For 202 years \$6075. For 203 years \$6105. For 204 years \$6135. For 205 years \$6165. For 206 years \$6195. For 207 years \$6225. For 208 years \$6255. For 209 years \$6285. For 210 years \$6315. For 211 years \$6345. For 212 years \$6375. For 213 years \$6405. For 214 years \$6435. For 215 years \$6465. For 216 years \$6495. For 217 years \$6525. For 218 years \$6555. For 219 years \$6585. For 220 years \$6615. For 221 years \$6645. For 222 years \$6675. For 223 years \$6705. For 224 years \$6735. For 225 years \$6765. For 226 years \$6795. For 227 years \$6825. For 228 years \$6855. For 229 years \$6885. For 230 years \$6915. For 231 years \$6945. For 232 years \$6975. For 233 years \$7005. For 234 years \$7035. For 235 years \$7065. For 236 years \$7095. For 237 years \$7125. For 238 years \$7155. For 239 years \$7185. For 240 years \$7215. For 241 years \$7245. For 242 years \$7275. For 243 years \$7305. For 244 years \$7335. For 245 years \$7365. For 246 years \$7395. For 247 years \$7425. For 248 years \$7455. For 249 years \$7485. For 250 years \$7515. For 251 years \$7545. For 252 years \$7575. For 253 years \$7605. For 254 years \$7635. For 255 years \$7665. For 256 years \$7695. For 257 years \$7725. For 258 years \$7755. For 259 years \$7785. For 260 years \$7815. For 261 years \$7845. For 262 years \$7875. For 263 years \$7905. For 264 years \$7935. For 265 years \$7965. For 266 years \$7995. For 267 years \$8025. For 268 years \$8055. For 269 years \$8085. For 270 years \$8115. For 271 years \$8145. For 272 years \$8175. For 273 years \$8205. For 274 years \$8235. For 275 years \$8265. For 276 years \$8295. For 277 years \$8325. For 278 years \$8355. For 279 years \$8385. For 280 years \$8415. For 281 years \$8445. For 282 years \$8475. For 283 years \$8505. For 284 years \$8535. For 285 years \$8565. For 286 years \$8595. For 287 years \$8625. For 288 years \$8655. For 289 years \$8685. For 290 years \$8715. For 291 years \$8745. For 292 years \$8775. For 293 years \$8805. For 294 years \$8835. For 295 years \$8865. For 296 years \$8895. For 297 years \$8925. For 298 years \$8955. For 299 years \$8985. For 300 years \$9015. For 301 years \$9045. For 302 years \$9075. For 303 years \$9105. For 304 years \$9135. For 305 years \$9165. For 306 years \$9195. For 307 years \$9225. For 308 years \$9255. For 309 years \$9285. For 310 years \$9315. For 311 years \$9345. For 312 years \$9375. For 313 years \$9405. For 314 years \$9435. For 315 years \$9465. For 316 years \$9495. For 317 years \$9525. For 318 years \$9555. For 319 years \$9585. For 320 years \$9615. For 321 years \$9645. For 322 years \$9675. For 323 years \$9705. For 324 years \$9735. For 325 years \$9765. For 326 years \$9795. For 327 years \$9825. For 328 years \$9855. For 329 years \$9885. For 330 years \$9915. For 331 years \$9945. For 332 years \$9975. For 333 years \$10005. For 334 years \$10035. For 335 years \$10065. For 336 years \$10095. For 337 years \$10125. For 338 years \$10155. For 339 years \$10185. For 340 years \$10215. For 341 years \$10245. For 342 years \$10275. For 343 years \$10305. For 344 years \$10335. For 345 years \$10365. For 346 years \$10395. For 347 years \$10425. For 348 years \$10455. For 349 years \$10485. For 350 years \$10515. For 351 years \$10545. For 352 years \$10575. For 353 years \$10605. For 354 years \$10635. For 355 years \$10665. For 356 years \$10695. For 357 years \$10725. For 358 years \$10755. For 359 years \$10785. For 360 years \$10815. For 361 years \$10845. For 362 years \$10875. For 363 years \$10905. For 364 years \$10935. For 365 years \$10965. For 366 years \$10995. For 367 years \$11025. For 368 years \$11055. For 369 years \$11085. For 370 years \$11115. For 371 years \$11145. For 372 years \$11175. For 373 years \$11205. For 374 years \$11235. For 375 years \$11265. For 376 years \$11295. For 377 years \$11325. For 378 years \$11355. For 379 years \$11385. For 380 years \$11415. For 381 years \$11445. For 382 years \$11475. For 383 years \$11505. For 384 years \$11535. For 385 years \$11565. For 386 years \$11595. For 387 years \$11625. For 388 years \$11655. For 389 years \$11685. For 390 years \$11715. For 391 years \$11745. For 392 years \$11775. For 393 years \$11805. For 394 years \$11835. For 395 years \$11865. For 396 years \$11895. For 397 years \$11925. For 398 years \$11955. For 399 years \$11985. For 400 years \$12015. For 401 years \$12045. For 402 years \$12075. For 403 years \$12105. For 404 years \$12135. For 405 years \$12165. For 406 years \$12195. For 407 years \$12225. For 408 years \$12255. For 409 years \$12285. For 410 years \$12315. For 411 years \$12345. For 412 years \$12375. For 413 years \$12405. For 414 years \$12435. For 415 years \$12465. For 416 years \$12495. For 417 years \$12525. For 418 years \$12555. For 419 years \$12585. For 420 years \$12615. For 421 years \$12645. For 422 years \$12675. For 423 years \$12705. For 424 years \$12735. For 425 years \$12765. For 426 years \$12795. For 427 years \$12825. For 428 years \$12855. For 429 years \$12885. For 430 years \$12915. For 431 years \$12945. For 432 years \$12975. For 433 years \$13005. For 434 years \$13035. For 435 years \$13065. For 436 years \$13095. For 437 years \$13125. For 438 years \$13155. For 439 years \$13185. For 440 years \$13215. For 441 years \$13245. For 442 years \$13275. For 443 years \$13305. For 444 years \$13335. For 445 years \$13365. For 446 years \$13395. For 447 years \$13425. For 448 years \$13455. For 449 years \$13485. For 450 years \$13515. For 451 years \$13545. For 452 years \$13575. For 453 years \$13605. For 454 years \$13635. For 455 years \$13665. For 456 years \$13695. For 457 years \$13725. For 458 years \$13755. For 459 years \$13785. For 460 years \$13815. For 461 years \$13845. For 462 years \$13875. For 463 years \$13905. For 464 years \$13935. For 465 years \$13965. For 466 years \$13995. For 467 years \$14025. For 468 years \$14055. For 469 years \$14085. For 470 years \$14115. For 471 years \$14145. For 472 years \$14175. For 473 years \$14205. For 474 years \$14235. For 475 years \$14265. For 476 years \$14295. For 477 years \$14325. For 478 years \$14355. For 479 years \$14385. For 480 years \$14415. For 481 years \$14445. For 482 years \$14475. For 483 years \$14505. For 484 years \$14535. For 485 years \$14565. For 486 years \$14595. For 487 years \$14625. For 488 years \$14655. For 489 years \$14685. For 490 years \$14715. For 491 years \$14745. For 492 years \$14775. For 493 years \$14805. For 494 years \$14835. For 495 years \$14865. For 496 years \$14895. For 497 years \$14925. For 498 years \$14955. For 499 years \$14985. For 500 years \$15015. For 501 years \$15045. For 502 years \$15075. For 503 years \$15105. For 504 years \$15135. For 505 years \$15165. For 506 years \$15195. For 507 years \$15225. For 508 years \$15255. For 509 years \$15285. For 510 years \$15315. For 511 years \$15345. For 512 years \$15375. For 513 years \$15405. For 514 years \$15435. For 515 years \$15465. For 516 years \$15495. For 517 years \$15525. For 518 years \$15555. For 519 years \$15585. For 520 years \$15615. For 521 years \$15645. For 522 years \$15675. For 523 years \$15705. For 524 years \$15735. For 525 years \$15765. For 526 years \$15795. For 527 years \$15825. For 528 years \$15855. For 529 years \$15885. For 530 years \$15915. For 531 years \$15945. For 532 years \$15975. For 533 years \$16005. For 534 years \$16035. For 535 years \$16065. For 536 years \$16095. For 537 years \$16125. For 538 years \$16155. For 539 years \$16185. For 540 years \$16215. For 541 years \$16245. For 542 years \$16275. For 543 years \$16305. For 544 years \$16335. For 545 years \$16365. For 546 years \$16395. For 547 years \$16425. For 548 years \$16455. For 549 years \$16485. For 550 years \$16515. For 551 years \$16545. For 552 years \$16575. For 553 years \$16605. For 554 years \$16635. For 555 years \$16665. For 556 years \$16695. For 557 years \$16725. For 558 years \$16755. For 559 years \$16785. For 560 years \$16815. For 561 years \$16845. For 562 years \$16875. For 563 years \$16905. For 564 years \$16935. For 565 years \$16965. For 566 years \$16995. For 567 years \$17025. For 568 years \$17055. For 569 years \$17085. For 570 years \$17115. For 571 years \$17145. For 572 years \$17175. For 573 years \$17205. For 574 years \$17235. For 575 years \$17265. For 576 years \$17295. For 577 years \$17325. For 578 years \$17355. For 579 years \$17385. For 580 years \$17415. For 581 years \$17445. For 582 years \$17475. For 583 years \$17505. For 584 years \$17535. For 585 years \$17565. For 586 years \$17595. For 587 years \$17625. For 588 years \$17655. For 589 years \$17685. For 590 years \$17715. For 591 years \$17745. For 592 years \$17775. For 593 years \$17805. For 594 years \$17835. For 595 years \$17865. For 596 years \$17895. For 597 years \$17925. For 598 years \$17955. For 599 years \$17985. For 600 years \$18015. For 601 years \$18045. For 602 years \$18075. For 603 years \$18105. For 604 years \$18135. For 605 years \$18165. For 606 years \$18195. For 607 years \$18225. For 608 years \$18255. For 609 years \$18285. For 610 years \$18315. For 611 years \$18345. For 612 years \$18375. For 613 years \$18405. For 614 years \$18435. For 615 years \$18465. For 616 years \$18495. For 617 years \$18525. For 618 years \$18555. For 619 years \$18585. For 620 years \$18615. For 621 years \$18645. For 622 years \$18675. For 623 years \$18705. For 624 years \$18735. For 625 years \$18765. For 626 years \$18795. For 627 years \$18825. For 628 years \$18855. For 629 years \$18885. For 630 years \$18915. For 631 years \$18945. For 632 years \$18975. For 633 years \$19005. For 634 years \$19035. For 635 years \$19065. For 636 years \$19095. For 637 years \$19125. For 638 years \$19155. For 639 years \$19185. For 640 years \$19215. For 641 years \$19245. For 642 years \$19275. For 643 years \$19305. For 644 years \$19335. For 645 years \$19365. For 646 years \$19395. For 647 years \$19425. For 648 years \$19455. For 649 years \$19485. For 650 years \$19515. For 651 years \$19545. For 652 years \$19575. For 653 years \$19605. For 654 years \$19635. For 655 years \$19665. For 656 years \$19695. For 657 years \$19725. For 658 years \$19755. For 659 years \$19785. For 660 years \$19815. For 661 years \$19845. For 662 years \$19875. For 663 years \$19905. For 664 years \$19935. For 665 years \$19965. For 666 years \$19995. For 667 years \$20025. For 668 years \$20055. For 669 years \$20085. For 670 years \$20115. For 671 years \$20145. For 672 years \$20175. For 673 years \$20205. For 674 years \$20235. For 675 years \$20265. For 676 years \$20295. For 677 years \$20325. For 678 years \$20355. For 679 years \$20385. For 680 years \$20415. For 681 years \$20445. For 682 years \$20475. For 683 years \$20505. For 684 years \$20535. For 685 years \$20565. For 686 years \$20595. For 687 years \$20625. For 688 years \$20655. For 689 years \$20685. For 690 years \$20715. For 691 years \$20745. For 692 years \$20775. For 693 years \$20805. For 694 years \$20835. For 695 years \$20865. For 696 years \$20895. For 697 years \$20925. For 698 years \$20955. For 699 years \$20985. For 700 years \$21015. For 701 years \$21045. For 702 years \$21075. For 703 years \$21105. For 704 years \$21135. For 705 years \$21165. For 706 years \$21195. For 707 years \$21225. For 708 years \$21255. For 709 years \$21285. For 710 years \$21315. For 711 years \$21345. For 712 years \$21375. For 713 years \$21405. For 714 years \$21435. For 715 years \$21465. For 716 years \$21495. For 717 years \$21525. For 718 years \$21555. For 719 years \$21585. For 720 years \$21615. For 721 years \$21645. For 722 years \$21675. For 723 years \$21705. For 724 years \$21735. For 725 years \$21765. For 726 years \$21795. For 727 years \$21825. For 728 years \$21855. For 729 years \$21885. For 730 years \$21915. For 731 years \$21945. For 732 years \$21975. For 733 years \$22005. For 734 years \$22035. For 735 years \$22065. For 736 years \$22095. For 737 years \$22125. For 738 years \$22155. For 739 years \$22185. For 740 years \$22215. For 741 years \$22245. For 742 years \$22275. For 743 years \$22305. For 744 years \$22335. For 745 years \$22365. For 746 years \$22395. For 747 years \$22425. For 748 years \$22455. For 749 years \$22485. For 750 years \$22515. For 751 years \$22545. For 752 years \$22575. For 753 years \$22605. For 754 years \$22635. For 755 years \$22665. For 756 years \$22695. For 757 years \$22725. For 758 years \$22755. For 759 years \$22785. For 760 years \$22815. For 761 years \$22845. For 762 years \$22875. For 763 years \$22905. For 764 years \$22935. For 765 years \$22965. For 766 years \$22995. For 767 years \$23025. For 768 years \$23055. For 769 years \$23085. For 770 years \$23115. For 771 years \$23145. For 772 years \$23175. For 773 years \$23205. For 774 years \$23235. For 775 years \$23265. For 776 years \$23295. For 777 years \$23325. For 778 years \$23355. For 779 years \$23385. For 780 years \$23415. For 781 years \$23445. For 782 years \$23475. For 783 years \$23505. For 784 years \$23535. For 785 years \$23565. For 786 years \$23595. For 787 years \$23625. For 788 years \$23655. For 789 years \$23685. For 790 years \$23715. For 791 years \$23745. For 792 years \$23775. For 793 years \$23805. For 794 years \$23835. For 795 years \$23865. For 796 years \$23895. For 797 years \$23925. For 798 years \$23955. For 799 years \$23985. For 800 years \$24015. For 801 years \$24045. For 802 years \$24075. For 803 years \$24105. For 804 years \$24135. For 805 years \$24165. For 806 years \$24195. For 807 years \$24225. For 808 years \$24255. For 809 years \$24285. For 810 years \$24315. For 811 years \$24345. For 812 years \$24375. For 813 years \$24405. For 814 years \$24435. For 815 years \$24465. For 816 years \$24495. For 817 years \$24525. For 818 years \$24555. For 819 years \$24585. For 820 years \$24615. For 821 years \$24645. For 822 years \$24675. For 823 years \$24705. For 824 years \$24735. For 825 years \$24765. For 826 years \$24795. For 827 years \$24825. For 828 years \$24855. For 829 years \$24885. For 830 years \$24915. For 831 years \$24945. For 832 years \$24975. For 833 years \$25005. For 834 years \$25035. For 835 years \$25065. For 836 years \$25095. For 837 years \$25125. For 838 years \$25155. For 839 years \$25185. For 840 years \$25215. For 841 years \$25245. For 842 years \$25275. For 843 years \$25305. For 844 years \$25335. For 845 years \$25365. For 846 years \$25395. For 847 years \$25425. For 848 years \$25455. For 849 years \$25485. For 850 years \$25515. For 851 years \$25545. For 852 years \$25575. For 853 years \$25605. For 854 years \$25635. For 855 years \$25665. For 856 years \$25695. For 857 years \$25725. For 858 years \$25755. For 859 years \$25785. For 860 years \$25815. For 861 years \$25845. For 862 years \$25875. For 863 years \$25905. For 864 years \$25935. For 865 years \$25965. For 866 years \$25995. For 867 years \$26025. For 868 years \$26055. For 869 years \$26085. For 870 years \$26115. For 871 years \$26145. For 872 years \$26175. For 873 years \$26205. For 874 years \$26235. For 875 years \$26265. For 876 years \$26295. For 877 years \$26325. For 878 years \$26355. For 879 years \$26385. For 880 years \$26415. For 881 years \$26445. For 882 years \$26475. For 883 years \$26505. For 884 years \$26535. For 885 years \$26565. For 886 years \$26595. For 887 years \$26625. For 888 years \$26655. For 889 years \$26685. For 890 years \$26715. For 891 years \$26745. For 892 years \$26775. For 893 years \$26805. For 894 years \$26835. For 895 years \$26865. For 896 years \$26895. For 897 years \$26925. For 898 years \$26955. For 899 years \$26985. For 900 years \$27015. For 901 years \$27045. For 902 years \$27075. For 903 years



By Bob Grove,
Publisher

Sweeping Frequency Ban Proposal Could End Scanning!

PRESS STOP! *This editorial is a last-minute substitution in order to provide our readers with the latest federal effort to place massive restrictions on the receiving equipment Americans are permitted to buy.*

Steps to restrict Americans' access to the airwaves began fifteen years ago: On November 8, 1982, President Reagan issued Executive Order 12356, classifying as "Confidential" the Government Master File (GMF) of radio frequency assignments. At that time, Bernie Wunder, Assistant Secretary for the Committee of Communications and Information, developed a classification guide for members of the Interdepartment Radio Advisory Committee (IRAC).

In an attempt at moderation, on April 20, 1995, President Clinton, outlining the dangers of over-classification, issued Executive Order 12958 to begin declassification, and so far there are some 100,000 declassified frequencies now available from the GMF.

But we have just received a copy of a legislative proposal which, if passed, could well lead to the elimination of scanners, as well as the scanning receiver portions of commercial and amateur radio transceivers. Not surprisingly, the new sanctions come from the office of Edward Markey (D-MA), the privileged member of last February's Congressional Subcommittee on Telecommunications hearings who, upon being shown that his previous lawmaking efforts were defective, forewarned that we would "see scanner sales drop precipitously." And now he's making that promise good.

What is surprising is that, in spite of Markey's record of flawed rulemaking efforts, Congress has once again entrusted him with more rulemaking. Predictably, his new proposals are ill-considered, sweeping, and reactionary, as if to punish the radio communications industry.

The Bill, HR1964, begins by reforming the Internet, a section which, by itself, is already generating considerable ire from the telecommunications industry, but it is the scanner portion of the Bill which we shall address

here. Markey proposes to ban all of the frequencies allocated to the newly-defined Commercial Mobile Radio Services (CMRS) on future scanners. Let's take a look at the list of frequencies to be cut:

30.76-31.24, 33.14-33.16, 33.40, 35.02-35.14, 35.18, 35.20-35.66, 35.7-35.72, 35.88-35.98, 42.96-43.00, 43.20-43.66, 137-138, 148-150.050, 151.625-151.955, 152.030-152.240, 152.480-152.840, 154.570-154.600, 154.625, 157.200-157.400, 157.740-158.100, 158.460-159.700, 161.800-162.000, 216-222, 399.900-400.050, 4540-455, 457.525-457.600, 459-460, 460.650-462.1875, 462.750-462.925, 463.200-465, 465.650-467.1875, 467.750-467.925, 468.200-470 (and similar chunks of the 470-512 MHz band), 806-821, 824-866, 869-902, 929-932, 940-941, 1525-1559, 1610-1660.5, and 1850-1990 MHz.

That's over 363 megahertz—nearly 20% of the entire VHF/UHF scanner spectrum from 30-2000 MHz! Pretty scary. And that's just the beginning.

As it is, HR1964 would remove access not only to the mobile radiotelephone services (which was its superficial intent), but also weather satellites, Military Affiliate Radio System (MARS), Civil Air Patrol (CAP), many Experimental/Developmental frequencies needed for scientific and commercial purposes, low power industrial, itinerant, and many others as well.

It is the intent of some that the censoring not stop at this. We have learned from a high-placed government official that law enforcement representatives are requesting the elimination of public safety frequencies from scanners.

There *is* some good news: At this writing, it would appear that there are many more rational (or at least, more cautious) members of Congress—there is no hearing scheduled for the Bill, and it has no cosponsors! Of course, this could change with time, and with lobbying; on its surface Section 104 of HR1964 appears innocuous—even reasonable. It is important that you write your Congressman or Congresswoman and express your opposition to what is, in fact, an outrageous proposal before someone takes it seriously.

RM

WHAT THE EXPERTS SAY:

"BOTTOM LINE:

A top notch receiver/scanner with quality and features to please the discriminating and serious SWL or monitoring buff.

This handsome receiver is a terrific centerpiece or complement to any listening shack."

— QST, April 1997.

"R8500 construction is impressive.

A rugged, die-cast aluminum chassis is used to hold and shield the various circuit boards. Good grounding and shielding are required to prevent a receiver from 'hearing' its own circuitry, resulting in birdies.

The large padded tuning knob and rubber keys exude quality and are easy to operate....

The yellow backlit LCD display has excellent contrast, making it much easier to read...."

— Monitoring Times, January 1997.

"...it's on HF where the ICOM really shines. The R8500 has both a Noise Blanker circuit and Intermediate Frequency Shift that really help reduce or eliminate interference on short-wave frequencies.

The ICOM's Audio Peak Filter is also very effective at helping voices to 'pop out' of the HF background noise."

— Popular Communications, February 1997.



Extra Wide Coverage, All Mode

Cover frequencies from 100 kHz to 1,999.99 MHz* using 10 Hz tuning steps. Receive SSB (USB, LSB), AM (normal/narrow/wide), FM, WFM, & CW!

Built-In ICOM Hardware for Easy, Powerful Computer Control

The IC-R8500 is designed to grow along with your communication needs. A CI-V serial communications port (no additional level converter required) and a RS-232C PC connection port are built-in. Use third party software to enhance the IC-R8500's already impressive basic controls.*

- Boost memory channel capacity up into the thousands
- Increase scanning speeds and further customize scanning preferences
- Create expanded alpha tags for each programmed frequency
- Use computer keyboard shortcuts to instantly change receiver settings
- Define search ranges by frequency, step, mode, database service code or other category
- Log & edit receiver data with date,

time, signal strength, etc.

- Convert data into expanded memory banks
- Set the volume control by channel
- And much more!

IF-Shift and Audio Peak Filter

Signals come in loud and clear! In SSB mode, an IF-Shift function rejects nearby interfering signals. In FM mode, an Audio Peak Filter provides tone control. And to compensate for FM, FM-N or WFM station frequency drift, an Auto Frequency Control helps keep the IC-R8500 right on frequency!



IC-R8500

Advanced Worldwide Base Station Receiver



- High Stability (<30 MHz: ± 100 Hz, VHF/UHF: ± 3 ppm)
- New DDS (Digital Direct Synthesis)
- New PLL (Phase-Locked Loop)
- Selectable AGC Time Constant

- 1000 Memory Channels: 20 Banks of 40 (total of 800 "normal"), 100 Skip Scan, and 100 Auto Write Memory Scan
- S-Meter Squelch

- Noise Blanker (SSB/AM)
- 3 Antenna Connectors
- Operates on AC or DC power

Call 425-450-6088 for a free brochure!

Questions? Contact ICOM Technical Support in the HamNet forum on CompuServe® @75540.525 (Internet: 75540.525@compuserve.com.) © 1997 ICOM America, Inc., 2380-TT16th Ave. N.E., Bellevue, WA 98004 • 425-454-8155. The ICOM logo is a registered trademark of ICOM, Inc. *Specifications are guaranteed 0.1 to 1000 MHz and 1240 to 1300 MHz. Cellular blocked: unblocked versions available only to FCC approved users. **Not all software manufactured for the IC-R8500 may offer each listed capability. Please check with your authorized ICOM dealer or the individual software manufacturer for complete details regarding a particular software's capabilities. All ICOM radios significantly exceed FCC regulations limiting spurious emissions. CompuServe is a registered trademark of CompuServe, Incorporated, an H&R Block Company. R8500397Y

ICOM®

RECEIVERS

<http://www.icomamerica.com>

QuickCheck

The **Xplorer** Test Receiver. The professional choice when speed, performance, and reliability are an issue !

For Commercial and Mobile Radio testing, the **Optoelectronics Xplorer** stands alone. Let the Xplorer perform all your quick radio checks, instantly determining the radio's frequency, **CTCSS**, **DCS**, **DTMF**, deviation or signal strength. The Xplorer automatically locks on to any nearfield signal from **30MHz - 2GHz** in less than a second.

There is **no setup necessary**. Whether you're in the field or in the shop, the Xplorer is the portable, compact and **economical solution** for any two-way communications business.



Patent No. 5,471,408

FEATURES

- Nearfield receiver, sweeps **30MHz-2GHz** in <1 second (Cellular bands are blocked on all U.S. versions)
- Decodes **CTCSS**, **DCS**, and **DTMF**. Manually record tones into memory
- Lockout up to 1000 frequencies
- Store **500 frequencies** in **memory** with time & date stamp, as well as number of hits per frequency
- NMEA-0183 **GPS interface** for recording Latitude & Longitude coordinates (GPS Required)
- **VFO mode** for tuning to specific frequencies
- PC interface for **downloading** data from **memory**
- FM demodulation / **Built-in speaker**
- **Auto** or manual frequency **hold**
- **Maximum nearfield** reception / Up to **1/4 mile** away

\$899

Summer Special Includes:
Spectrum CD & CC30 Case

Xplorer includes: TA100S antenna, NiCads, Charger, PC Download cable and software

SPECIFICATIONS

Freq. Range	30MHz - 2GHz
Modulation	FM Deviation
Freq. Response	50 - 3000Hz
Auto Sweep Time	<1 second
Input 50 Ohm	-59dBm @ 100MHz -25dBm @ 1GHz
Display	2 line LCD
Power	Internal NiCad



CTCSS Decode



DCS Decode



DTMF Decode

CTCSS, DCS, and DTMF Decoding

FACTORY DIRECT ORDER LINE: 800•327•5912

OPTOELECTRONICS®

Check out our Web Site
www.optoelectronics.com



MADE IN U.S.A.

5821 NE 14th Avenue • Ft. Lauderdale, FL • 33334

Telephone: 954•771•2050 Fax: 954•771•2052 EMail: sales@optoelectronics.com

Prices and specifications are subject to change without notice or obligation.

Payment terms are Visa, MasterCard or C.O.D. (Cash or MoneyOrder)